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FOOD MANUFACTURE

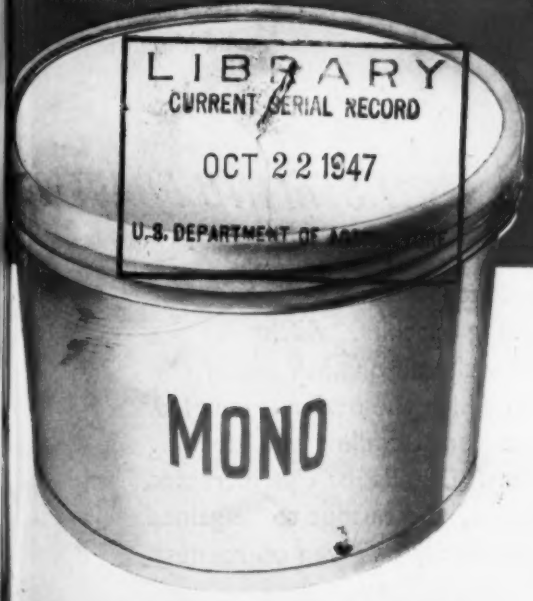
Incorporating Food Industries Weekly

ARD HILL, LIMITED, 17, STRATFORD PLACE, LONDON, W.1 OCTOBER 1, 194

e Most Important Thing next to the Products is the

PACKAGING

DECIDE ON MONO



Yes, make no mistake about it, the pack's the thing that counts on the sales counter. An attractively styled, hygienic MONO CONTAINER will win quicker customer response. Ideal for a host of peace-time products, including Foodstuffs, Dairy Products and Pharmaceutical Preparations. We are now ready to offer suggestions and submit designs for MONO CONTAINERS to meet the special requirements of the Food and Allied Trades. Your enquiries are invited.

MONO means BUSINESS

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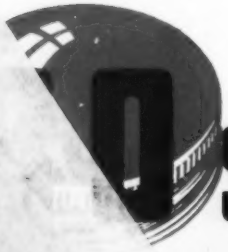
in line WITH MODERN SEALING PRACTICE

R.O. Seals put the finishing touch to Suttons Salad Cream. Shown above is our A.C. Sealing Machine which forms a closure with "tailor-made" screw thread on each bottle as it passes from the automatic filler to which the Sealer is coupled. Automatic sealing thus combined with automatic filling and labelling solves production and labour problems. Details of the increased efficiency, hygiene, and output to be gained will gladly be given on request.



R seals AND A.C. SEALING MACHINE

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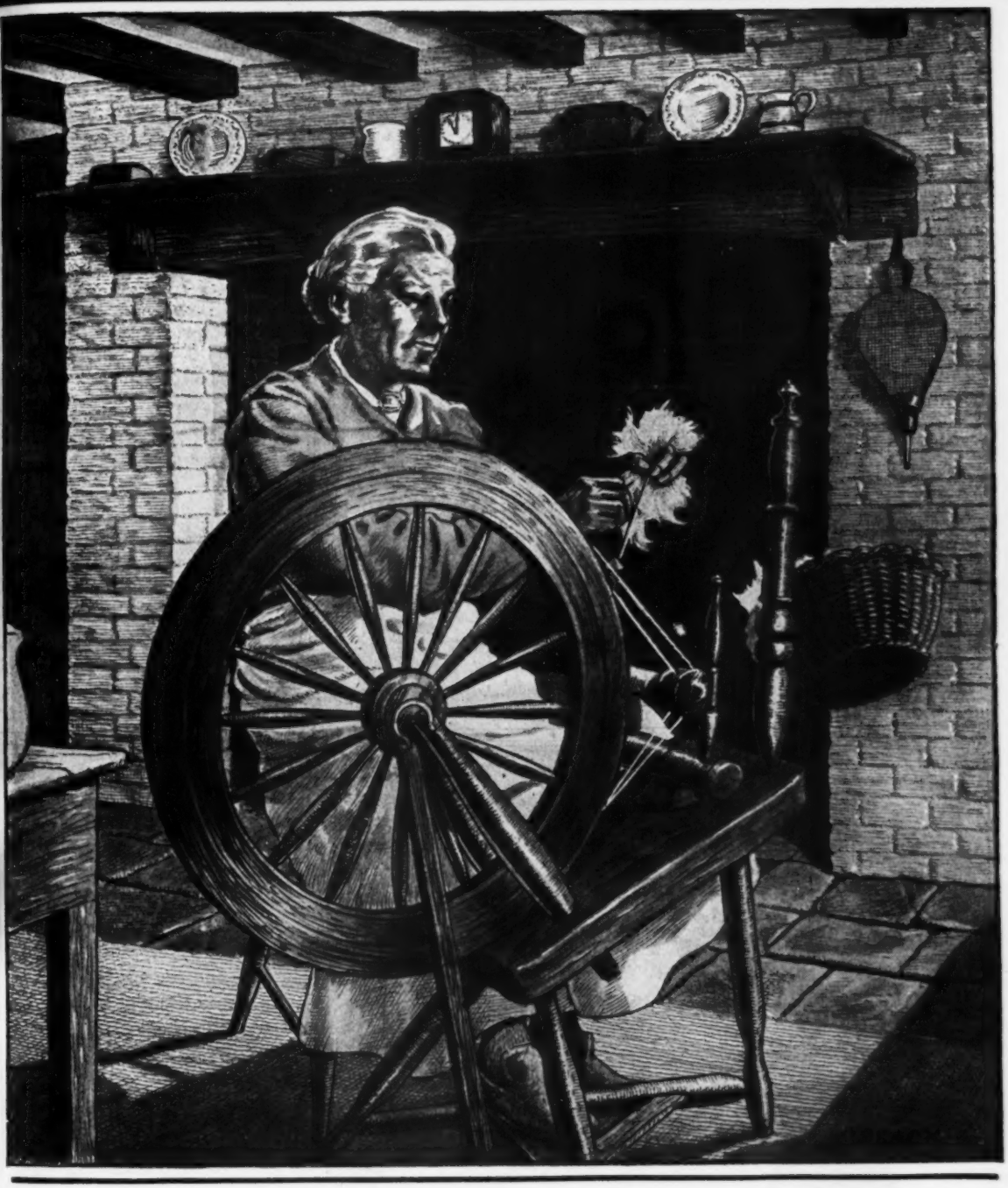

In all ages, the finest recompense for thorough workmanship put into the making of an article is the satisfaction given to the user.

TRADE MARK

GEORGE ELLISON
LIMITED
PERRY BARR BIRMINGHAM 22B

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DEPARTMENT OF TRADE AND COMMERCE

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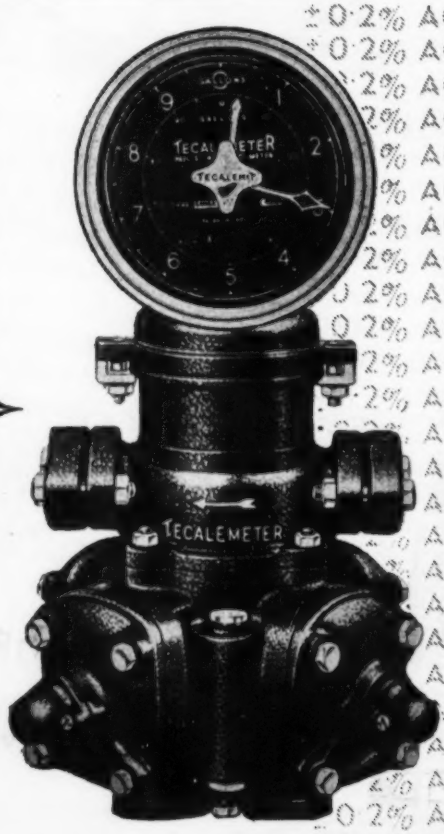

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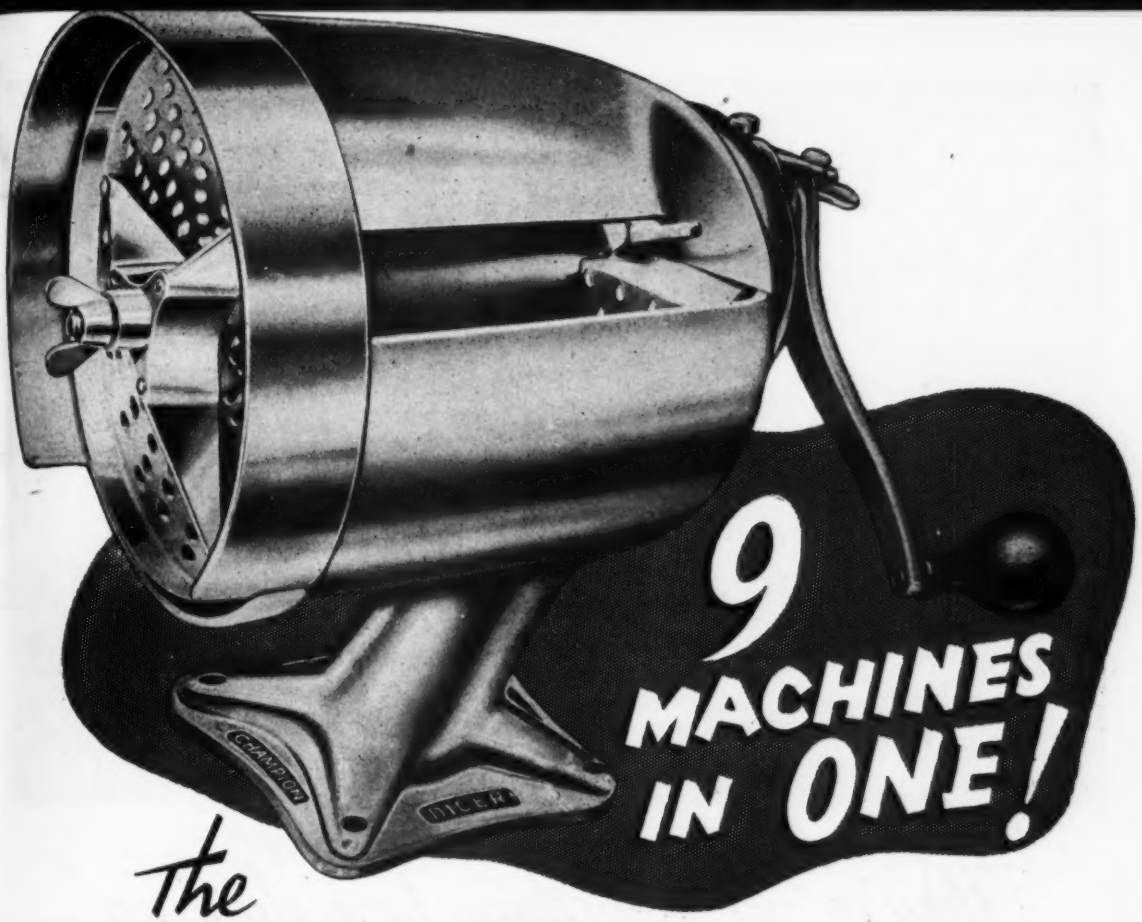

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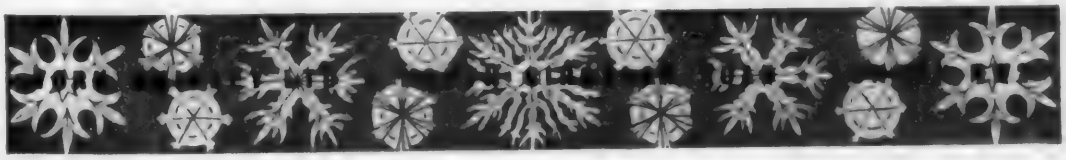

ZALDECIDE/D.D.T. QUICKLY KILLS COCKROACHES, FLIES, SILVERFISH, BUGS, CRICKETS, AND OTHER INSECTS. ZALDECIDE is made in powder and fluid form so you can use either according to circumstances. Not only does ZALDECIDE destroy insects—it prevents re-infestation. If you have any infestation problems write to Newton, Chambers & Co. Limited, Thorncliffe, Sheffield.

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ZALDECIDE / D.D.T.

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BENNETT SONS & SHEARS LTD.

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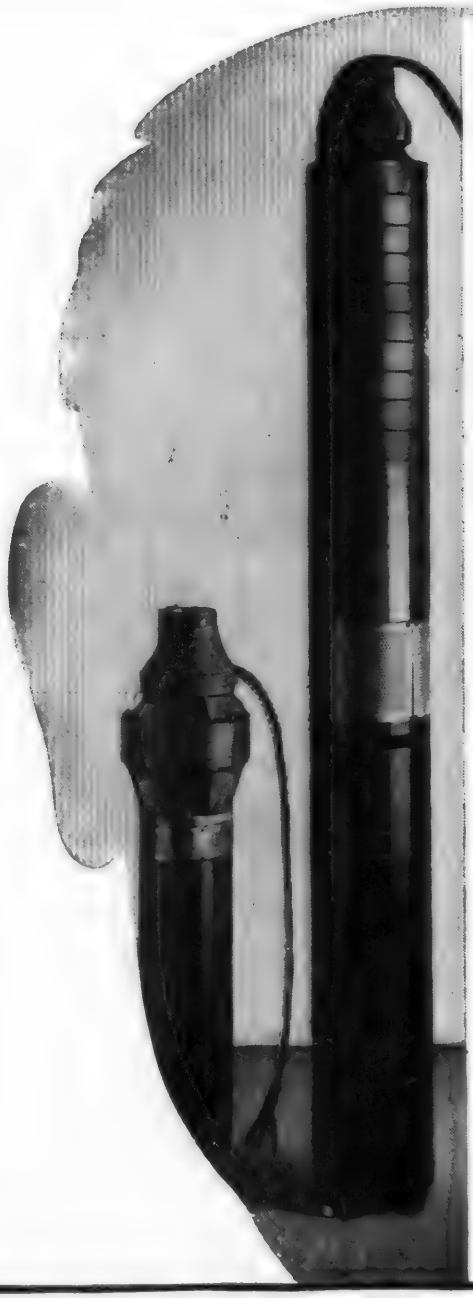
BS 433 *S.P.O.C*



OUT OF SIGHT, OUT OF MIND

Would it surprise you to learn that there was an electric pump within a few yards of you, pulling 40,000 gallons of clear cold water every hour from a deep well? You may know that there isn't, of course — but don't be too sure about it if you only know that you can't see one or hear one. A SUMO Submersible Pump, no matter how big its job, *works out of sight in the well, under water*. The motor and pump, joined into one compact unit, are suspended below the surface by the rising-main piping, which, with an electric cable, is its only connection with ground level.

It's wonderfully simple in practice. Installation and withdrawal are quick, easy and inexpensive, no matter how deep the borehole. No pumphouse, no driving shafts, no foundations, no static machinery are needed. Power is close coupled to the working parts. Priming and suction troubles are unknown. Noise is absent.

SUMO pumps run for 6,000 to 10,000 hours or more, in normal service, without attention. A Chance Brothers product, with more than a century of engineering reputation to back it, when once they're out of sight they're out of mind as well.

SUMO PUMPS LTD.

(Proprietors Chance Brothers Ltd.)

DEPT. U. BIRMINGHAM

LIGHTHOUSE WORKS, SMETHWICK
Phone: West Bromwich 1051

A Chance PRODUCT

OR, put more simply, four colours in letterpress or litho can nowadays give you an infinite colour range for your labels, cartons, booklets and advertising literature. Full colour, glowing colour, selling colour is now yours " at the price you like to pay ", thanks to the Brown & Bibby 8-point plan.

- ARTWORK creatively allied to natural colour photography, is carried out by our own studio staff, experienced in every aspect of modern design. Type chosen from a picked range of 33 mint-new faces is laid out for the finest effect under the direction of our typographer.
- LITHESK photo-litho plates prepared to give full colour range from four printings where six, seven or even ten were once necessary. A technical achievement only made possible by the scientific standardization of colours, screens, papers, inks.
- LETTERPRESS. True-to-life facsimile reproductions of the finest colour work printed on group sheets from blocks and inks developed in accordance with our specialised four-colour process.
- PACKAGING. Cartons of distinction are designed for eye-appeal — practical, easy to handle and to display. Produced on fast-running machines, and pre-folded to ensure trouble-free automatic packing.
- MACHINES . . . giant litho two colours . . . precision letterpress plant . . . giving dot-to-dot register for perfect reproduction. Cutters handled with precision so that your labels are accurately trimmed . . . essential for automatic labelling.
- LITHESK " revolving stock " plan cuts down heavy label stock — ensures crisp new labels always at keener prices whether for 25,000 or 25,000,000.
- RESEARCH and development work is always going on in our laboratory and engineering departments. We spend on this several times more than the .01% of turnover for British industry as a whole.
- COST ? Less than you would think, because of our full-colour " group run " method. We can produce your print in sparkling, sales-getting full-colour, at a price comparable with that asked for only two colours.

BROWN *and* BIBBY

Colour Printing by

LONDON OFFICE 123-5 QUEEN VICTORIA STREET EC4 TELEPHONE CENTRAL 9423

TUNS OF BEER

We have been large makers of Cast Iron Tanks and Vessels for a great many years and have specialised particularly in the manufacture of such Tanks as used by the Brewing Industry.

We are now developing our pre-war activities in this field. An additional service which we are now able to provide, however, is that such vessels, and indeed all vessels where sterile conditions are required, can now be lined with "Lithcote," for which we are the sole licensees.

"Lithcote"-lined Vessels are sterile and provide complete protection against corrosive media and prevent metallic contamination of product.

Please ask for a copy of our new Brochure. All enquiries in the United Kingdom and Ireland to:—
Newton Chambers & Co., Ltd., Thorncliffe Ironworks, Nr. Sheffield.

"LITHCOTE"
AN
"ENSECOTE"
PRODUCT

NEWTON CHAMBERS & Co. Ltd., THORNCLIFFE, Nr. SHEFFIELD
LONDON OFFICE: GRAND BUILDINGS, TRAFALGAR SQ., LONDON, W.C.2.

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GEE MANUFACTURING Co. Ltd.

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DESIGNED TO MEET TODAY'S NEED

Smooth and positive running without slip or stretch.

Easily installed and no maintenance needed.

Single Ropes transmit from ¼ to 23 horsepower according to size and speed.

Grooved Pulleys also supplied for drive conversions.

Write now for Prices and Technical Data

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are now being produced in a MORE CONCENTRATED FORM possessing a HIGHER DEGREE OF SOLUBILITY.

The high standard of purity laid down for the Edicol Colours has been fully maintained.

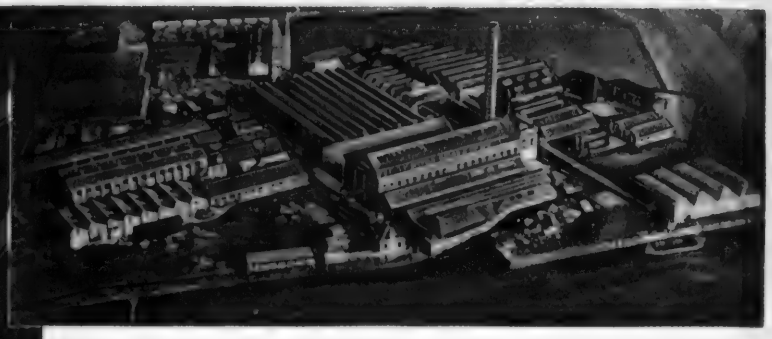
D.27

ICI

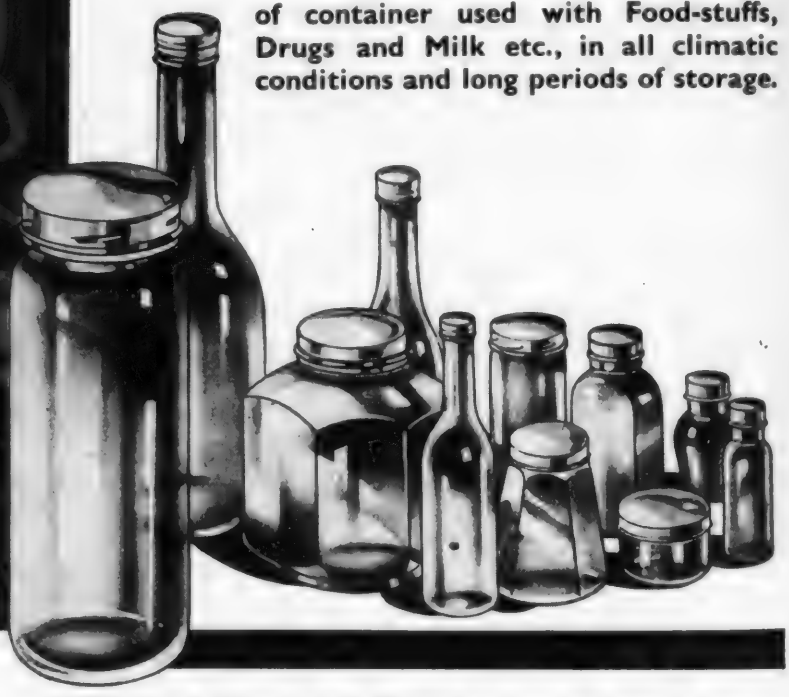
Information from I.C.I. Sales Offices.

IMPERIAL CHEMICAL INDUSTRIES LIMITED, NOBEL HOUSE, LONDON, S.W.1

WARNES RUBBER RINGS



Warnes specialise in manufacturing RINGS, DISCS etc., for any shape of container used with Food-stuffs, Drugs and Milk etc., in all climatic conditions and long periods of storage.



THE 3 ESSENTIALS
ACCURACY
QUALITY
DELIVERY

Trade Mark

WILLIAM WARNE & CO., LTD.
INDIA RUBBER MILLS, BARKING, ESSEX

ESTABLISHED 1837

Telephone: Rippleway 3803 Telegrams: "Warne Barking"

IRRESPECTIVE of the efficiency of the productive organisation which it served, this Railway Siding was itself the cause of losses. High *operating costs per ton*, and wear and tear on tracks and rolling stock involving heavy expenditure on replacements, were the results of neglect.

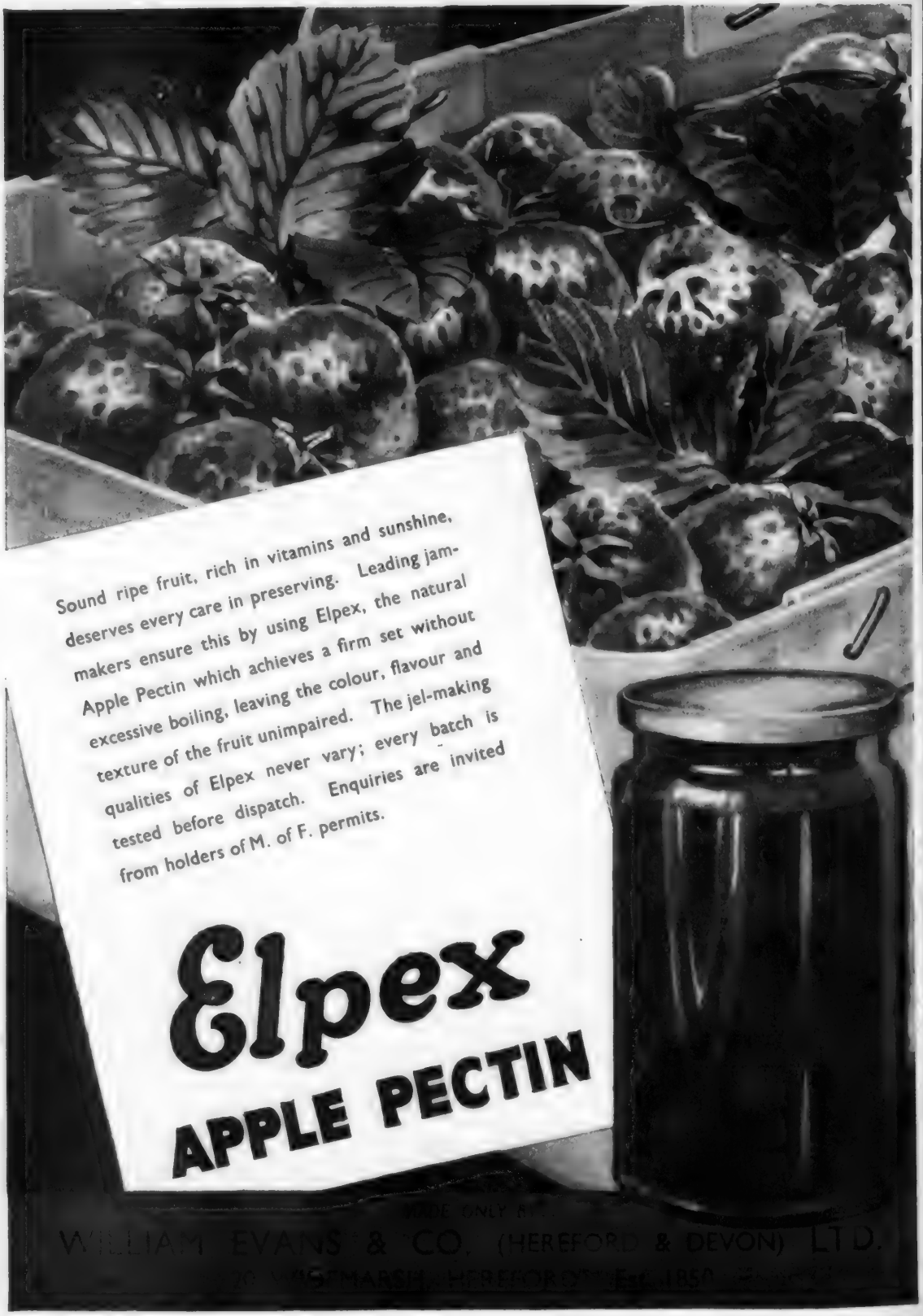
A Railway Siding fulfils a very important function ; through it flow raw materials, and finished or partly finished goods according to the character of the organisation. The planning of the original layout, the selection of specification and the subsequent installation and maintenance should receive attention comparable with that bestowed upon problems affecting the layout of the whole Works and Stores to which the Siding must be closely related.

SUMMERSONS

RAILWAY SIDING ENGINEERS

PLANNING · INSTALLATION · MAINTENANCE

THOMAS SUMMERSON AND SONS LIMITED, DARLINGTON


Sound ripe fruit, rich in vitamins and sunshine, deserves every care in preserving. Leading jam-makers ensure this by using Elpex, the natural Apple Pectin which achieves a firm set without excessive boiling, leaving the colour, flavour and texture of the fruit unimpaired. The jel-making qualities of Elpex never vary; every batch is tested before dispatch. Enquiries are invited from holders of M. of F. permits.
Elpex
APPLE PECTIN
WILLIAM EVANS & CO. (HEREFORD & DEVON) LTD.

Chemicals from petroleum:

TEEPOL

● A most versatile chemical derived from petroleum is TEEPOL—a surface active agent highly efficient in reducing both surface and interfacial tensions and important in many processes involving wetting, penetration, dispersion and detergency.

Chemically, TEEPOL is based on sodium higher alkyl sulphates and is marketed as a clear amber-coloured liquid. TEEPOL is soluble in water of any degree of hardness to give clear neutral solutions which do not hydrolyse and are stable over a wide range of pH values.

TEEPOL is effective, even at very low concentrations, in acid, alkaline or neutral solutions. The calcium and magnesium salts of TEEPOL are themselves readily soluble in water and consequently solutions of TEEPOL are no less satisfactory in hard than in soft water. TEEPOL is now being made on a large scale in this country and supplies are free and unrestricted.

In the food industry

In food manufacture, where the maintenance of high standards of cleanliness is essential to prevent bacterial contamination, the exceptional detergent properties of TEEPOL are of great assistance. TEEPOL is used alone or in conjunction with alkalies for the cleaning of all equipment. Maximum detergency is achieved with wood, glass, tinned plate, tinned copper, monel metal, nickel, stainless steel, mild steel, cast iron, copper and bronze. The cleaning of aluminium vessels is best done with TEEPOL solutions alone, owing to the risk of corrosion if alkali is used. The dispersive and emulsant properties of TEEPOL materially assist in the removal of grease even in the presence of acid fruit juices. Fuller details of the use of TEEPOL and related productions in the food industry may be obtained from:

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Nylon monofilament might almost have been created for the special needs of certain food processes. Where purity holds priority, the clean, efficient nylon brush is ideal.

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Nylon brushes, with their smooth uniform tufts, resist debris build-up. They are quick and easy to clean. They shed no filaments. They retain their resilient firmness throughout an exceptionally long life.

for NYLON MONOFILAMENT

Nylon monofilament, a product of Imperial Chemical Industries Limited, is now freely available to all Brush Makers.

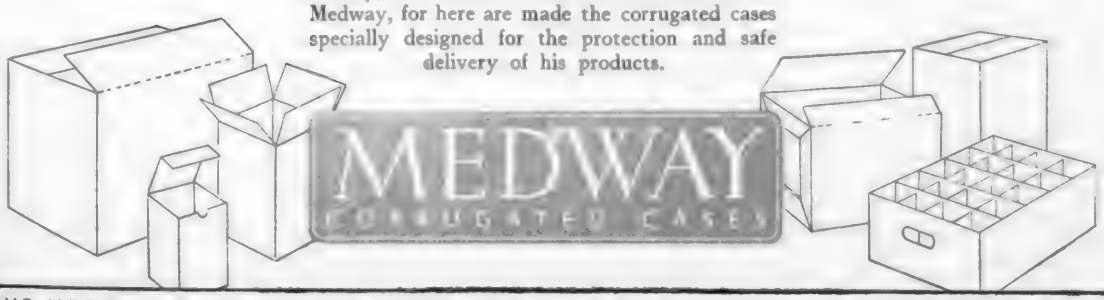
ICI

P.N 55

They Came to the Medway

THE BATTLE OF THE MEDWAY.—In 1667, during the second Dutch War, a fleet of seventy sail, under the command of de Ruyter, suddenly appeared in the Thames. The English hurriedly threw a boom across the Medway, mounted guns and brought a number of fire-ships into use. In spite of these measures an entrance was forced and the fort at Sheerness was levelled. Immense damage was done, including the burning of three first-line English ships and much panic was caused in London before the Dutch withdrew. The war ended with the Peace of Breda in July, 1667.

To-day, the British manufacturer turns to the Medway, for here are made the corrugated cases specially designed for the protection and safe delivery of his products.



THE MEDWAY CORRUGATED PAPER CO. LTD., NEW HYTHE, Nr. MAIDSTONE, KENT

London Sales Office: Blackfriars House, New Bridge Street, London, E.C.4

Coming from **BARTLETT'S** *factories—*

examples from a Complete Range of the most

MODERN KITCHEN EQUIPMENT

Bartlett's factories, with over a hundred years of practical experience behind them, are producing a constant flow of all Kitchen equipment and can be confidently relied upon to solve any COOKING and FOOD SERVICE problems. Descriptive Literature available.

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Designers and Manufacturers of *ESTABLISHED IN 1832*

COOKING AND FOOD SERVICE EQUIPMENT

G. F. E. BARTLETT & SON (METAL WORKERS) LTD.

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SPICE OILS

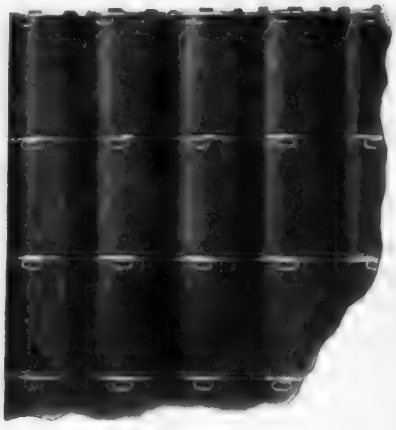
of the finest quality, including

CELERY OIL, CINNAMON OIL, CLOVE OIL, CORIANDER OIL, GINGER OIL, MACE OIL, NUTMEG OIL, PIMENTO OIL

May we have your enquiries?

STAFFORD ALLEN & SONS LTD. Wharf Road, London, N.1. 'Phone CLErkenwell 1000 (7 lines)

F. E. TYPE DRUMS



★ Reads "F.E." drums can be supplied with printed bodies to your design.

★ Available with flush strap handle (as shown) or with side handles.

★ Drums may be stacked on top of one another, thus saving storage space.

★ Any standard neck can be fitted to order.

Available in two sizes, 11" and 14" diameter.

READS "F.E." TYPE DRUMS were the first metal containers specially designed to enable drums to be stacked vertically to any height by means of the interrupted chimb head. A saving upward of 20 per cent storage space is possible compared with ordinary pattern drums stacked in pyramid formation. Transportation is easier and less bulky. Emptying is facilitated and the neck is fully protected against dirt, water, foreign matter or accidental damage. No water lies on the top of the drum as this is so designed as to permit all water to drain away if the drum is stacked on level ground.

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OF LIVERPOOL

Manufacturers of plain or printed tins, cans, kegs and drums

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London Office: 227, Grand Buildings, Trafalgar Square, London, W.C.2

Telephone: Whitehall 5781 Also at Glasgow, Belfast and Cork Telegrams: Oredanlim, Rand, London

B3071-B

SPIRAX corner

Dear H.D.

This photo of handbell ringing has the germ of an idea for our next advert. It is this: if you know how to use handbells you can make them give you a very nice tune. If you don't know how to use them the most you can make is a noise without getting anywhere at all. If you buy just "steam traps" without knowing how to use them properly you will get nowhere at all – and very quickly. But if you know how to use steam traps – if you understand good steam trapping practice – you will save much steam and will improve your plant output.

Other readers which is our new Bulletin – "Steam Economy" – every steam user's guide to good steam trapping methods. Ask them to send this enquiry slip for it.

SPIRAX SAVE STEAM

SPIRAX STEAM TRAPPING AND AIR VENTING

To SPIRAX MANUFACTURING CO., LTD., CHELTENHAM NAME:

Please reserve one copy of the new Spirax Technical Bulletin No. 16 on "STEAM ECONOMY" and post to this address as soon as available. ADDRESS:

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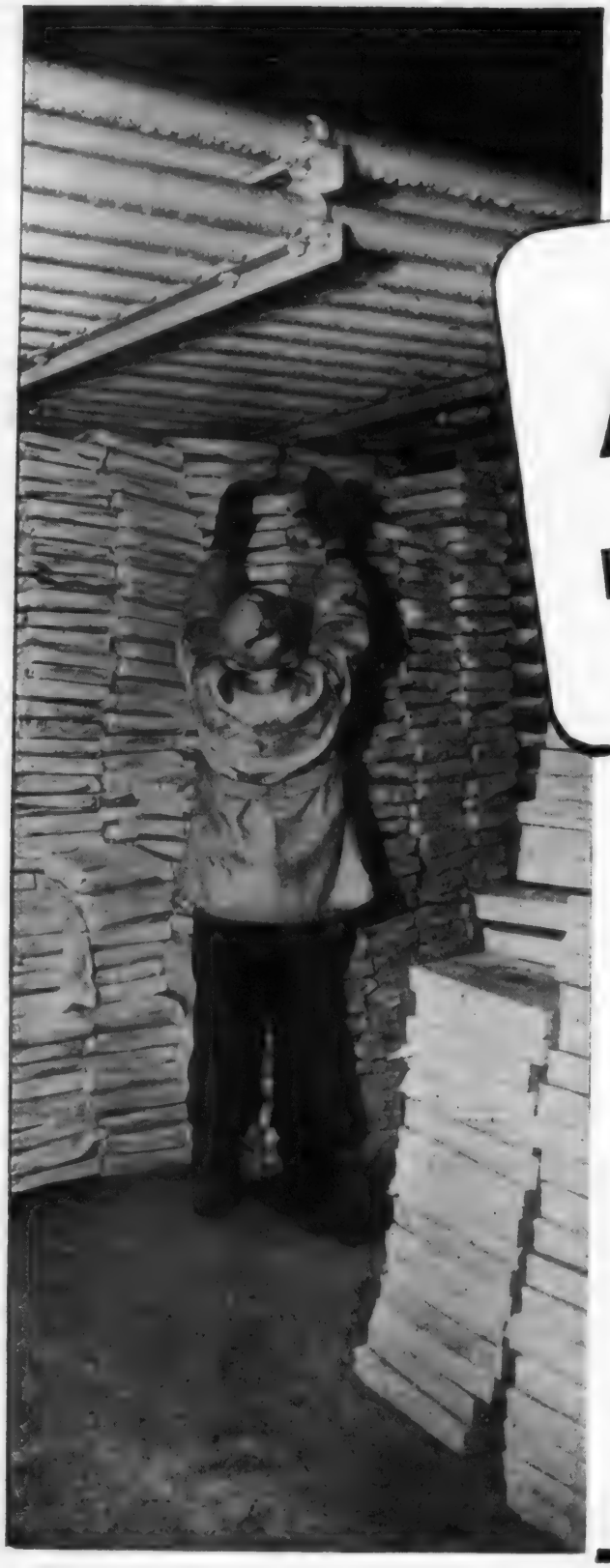

QUICK FREEZING

by

LOW TEMPERATURE AIR BLAST

This method of preserving original freshness, practically unimpaired, is now being applied successfully to a constantly extending range of products, but far more is involved than the purchase of a freezer and a refrigerating machine. There are associated problems concerned with preparation, storage and distribution which need careful consideration and call for expert advice in planning an installation.

Our successful experience in this new development is at the service of those having a genuine commercial interest in investigating the possibilities of this process applied to their products.

J. & E. HALL

LIMITED

DARTFORD IRONWORKS

DARTFORD - KENT

London Office:

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Seal with *security and satisfaction.*

POPPE RUBBER RINGS

Perfection in Seals!

GUARANTEED QUALITIES CONFORMING WITH FOOD AND DRUGS ACTS, for Phoenix, Automatic and Flat Caps, Sealing Compounds and Gummi Rings, Rubber Moulds for Fondants, etc. Every description of Rubber Goods for the Food Trade.

THE POPPE RUBBER & TYRE Co. Ltd.

TRADE MARK

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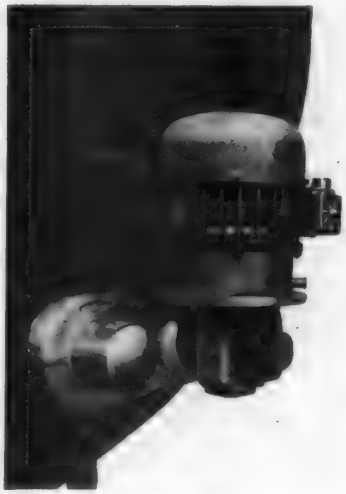
TWICKENHAM · MIDDLESEX

DETAILS ARE IMPORTANT

THE B. & R. HYGIENIC AGITATOR—As fitted to our tanks for Milk and other Foods.



Patent pending

- **Quiet running** — Final drive by chain in oil bath.
- **Instantaneous dismantling for cleaning** — By operator from inside tank; no shocks or blows required.
- **Without Gland** — Propellor automatically and correctly tensioned to prevent leakage.

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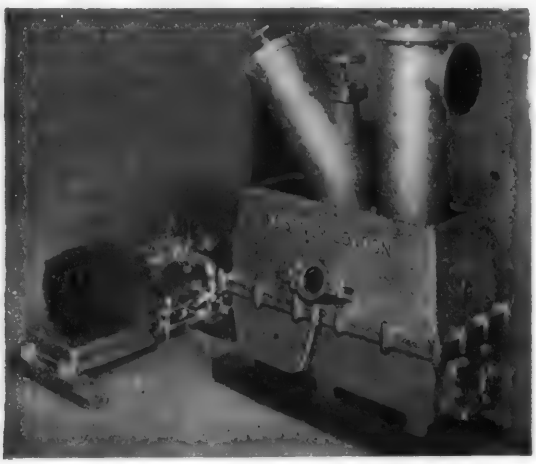
Phone: LIBerty 7045 *Grams:* Fullyquip, London

PENCE MAKE THE POUND

Manufacture your own SO_2 *with this* KESTNER

COMBINED SULPHUR BURNER & BLOWER



Food Manufacturers will find this handy Kestner plant ideally successful and economical for producing the perfect preservative for citrus fruits, soft fruits and fruit juices.

Please write for full particulars to

THE IDEAL FOOD PRESERVATIVE
for ● **CITRUS FRUITS**
● **SOFT FRUITS**
● **FRUIT JUICES**

KESTNER'S
Chemical Engineers
5 GROSVENOR GARDENS, LONDON, S.W.1

BULMER'S

FIRMAJEL

PECTIN

For crystal-clear Jellies

and attractive natural-colour Jams.

• **CONSISTENT QUALITY** • **PALE COLOUR** • **QUICK REGULAR SETTING POWER**

Manufacturers are invited to write for full information, trial samples, or bulk supplies to H. P. Bulmer & Co., Ltd., Hereford. Also at London and Manchester.

BULMER'S FIRMAJEL PECTIN

"Pleaster meetyer, Prof."

Will Might, the Mill-wright
———and the PROF.
Set-too, No. ONE

"I regret, Mr. Might, that I cannot be equally effusive. I rate men like you no higher than grub-screws. It could be little pleasure to me even were you worth meeting, which you are not."

"That's O.K. with me, Prof. We practical men think you're nuts, anyway — nuts rusted up, rounded-off with the wrong size spanner, immovable 'cept with a hack-saw. It's good to start by knowing one another, ain't it old cock?"

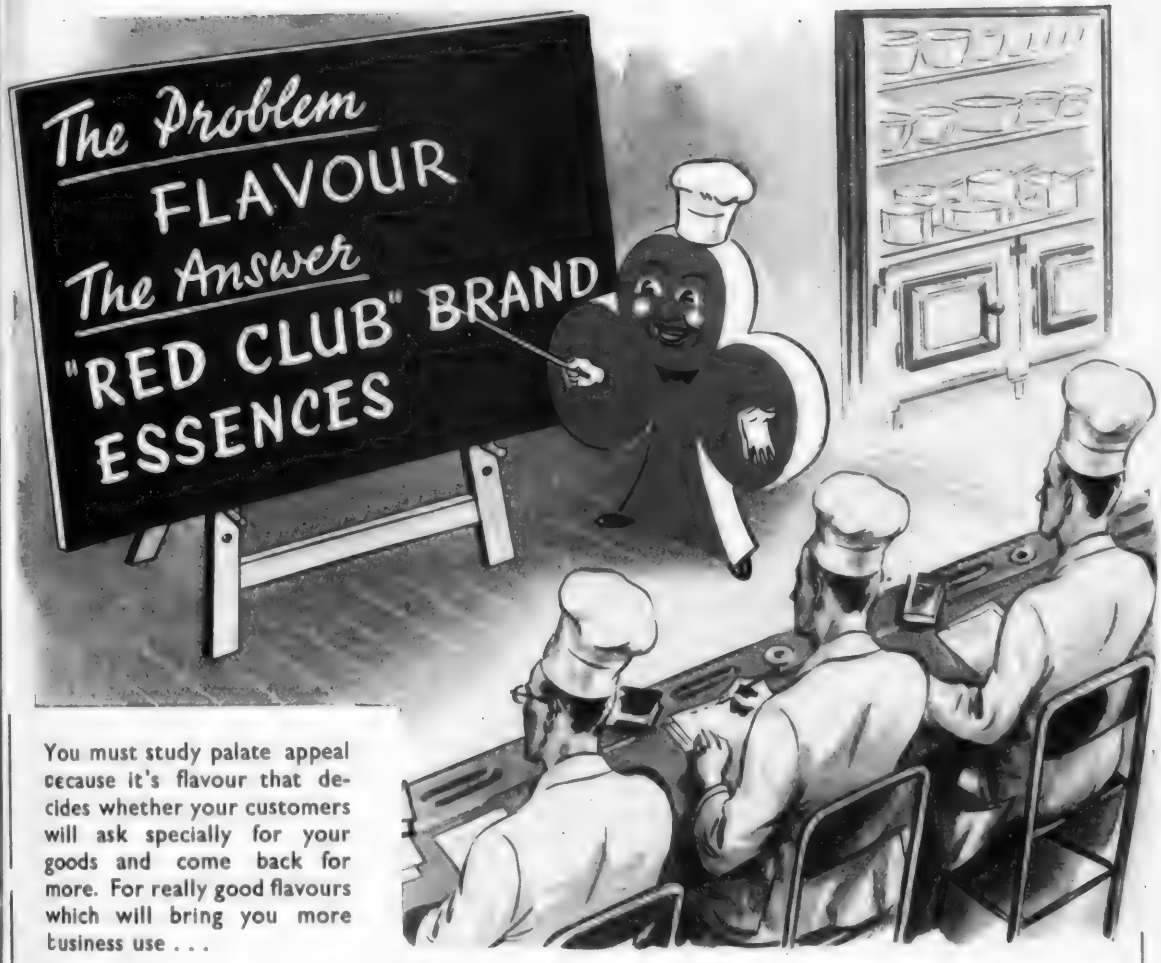
"I dislike you intensely, my man, but find your rudeness stimulating. As I understand it, we are to form a two-piece brains trust in this series of advertisements. We will speak fearlessly to one another. I represent brains and you represent brawn—if I may coin a phrase. But don't call me old cock."

"No, old cock, I represent practical experience and you, theory. But we will agree on one thing. I always use Hendrys' Belts, and you always advocate their use, although as far as you *know* belts are used only to keep pants up."

Hendrys'
BELTING

JAMES HENDRY LIMITED
LAMINATED LEATHER WORKS
252 MAIN ST., GLASGOW, S.E.

LONDON: KINGSWAY HOUSE, KINGSWAY, W.C.2
ABBEY HOUSE, 63 HOCKLEY HILL, BIRMINGHAM 18
MANCHESTER — and — JOHANNESBURG



You must study palate appeal because it's flavour that decides whether your customers will ask specially for your goods and come back for more. For really good flavours which will bring you more business use . . .

"RED CLUB" Brand

Essences, Essential Oils, Butter Flavour, etc. for all Food Products

B&F Barnett Foster Ltd.

ESTABLISHED IN THE YEAR 1858

RED CLUB BRAND PRODUCTS

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ESSENCES AND COLOURINGS

known for 96 years as the best

RAYNER & CO. LTD., LONDON, N. 18

Seven Pillars of Wisdom

The Self-Contained Economic Boilers served by these seven steel stacks are fitted with "Hodgkinson" Smokeless and Gritless Coking Stokers with Self-Cleaning grates. No smoke, no grit, low exit gas temperatures and less coal consumed for a given steam output. What could be wiser in these days of reduced fuel allocations and inferior qualities?

Write for our full explanatory Catalogue.

James Hodgkinson (Salford) **Ltd.**

BRETTENHAM HOUSE, LANCASTER PLACE, STRAND, W.C.2

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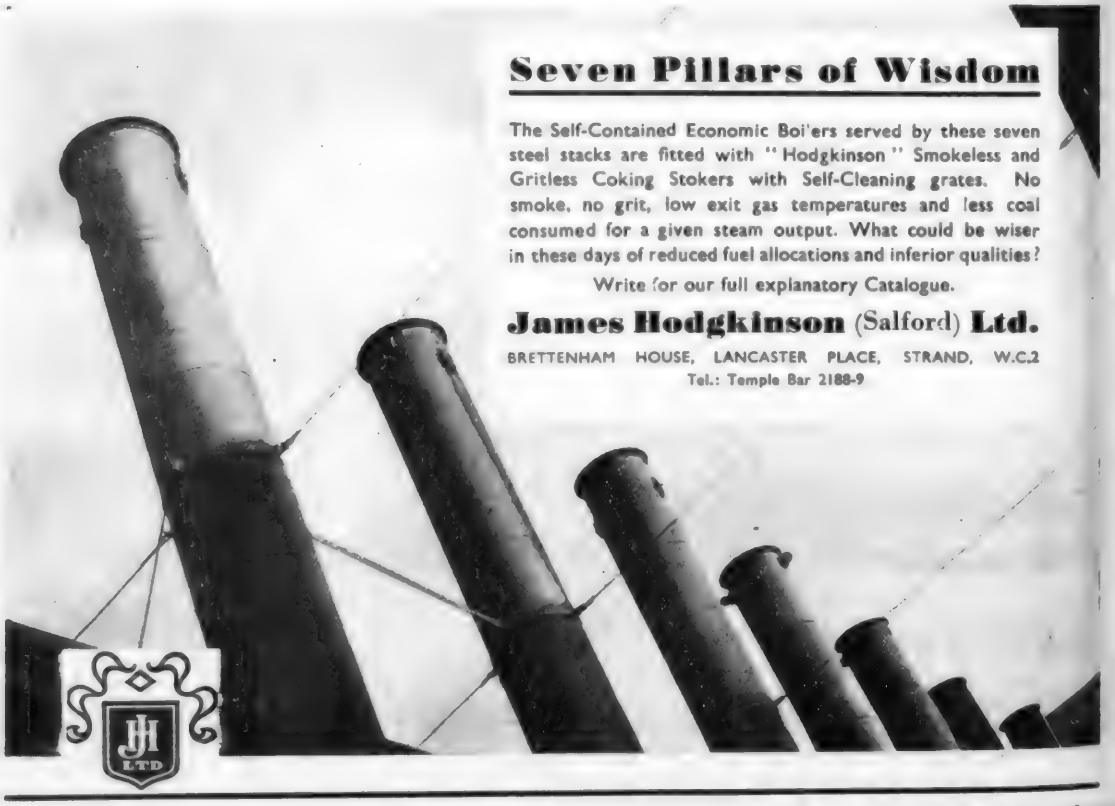
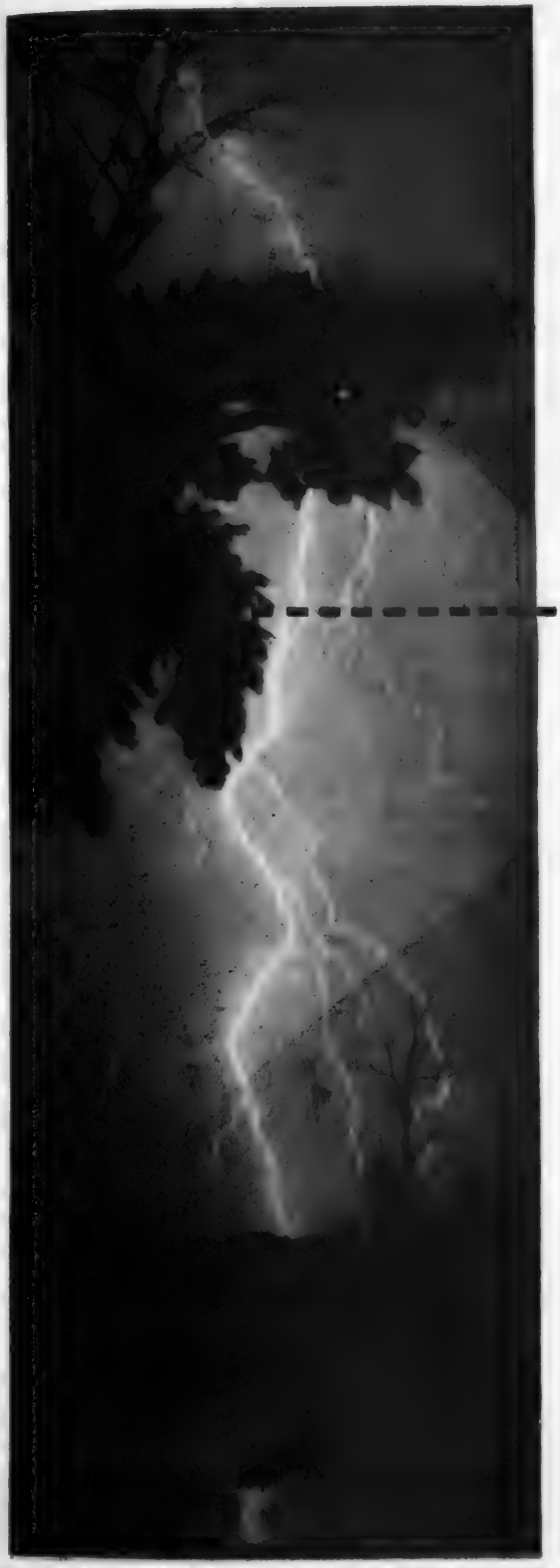




RELY on National . . . with its knowledge of every type of adhesive formula and use . . . to provide the exact setting speed for your specific job.

What is your adhesive problem? Do you need *fast adhesion* to get maximum production speeds from modern packaging machinery . . . to increase working floor space by reducing feed conveyor lengths . . . . to permit immediate stacking or despatch?

Or do you need *slow adhesion* . . . for tempering before hand bottle labelling . . . for delayed contact sealing or assembling . . . for accurately aligned billboard posting?

SHOULD AN ADHESIVE SET *in a flash?*

Setting speed — which must be maintained uniformly in fair weather or foul—is only one of the many properties an adhesive must have to do your specific job. An adhesive must be suited to surface conditions, shop use, storage and transport hazards. In addition, an adhesive should carry a final factor of operating safety as insurance against commercial variables.

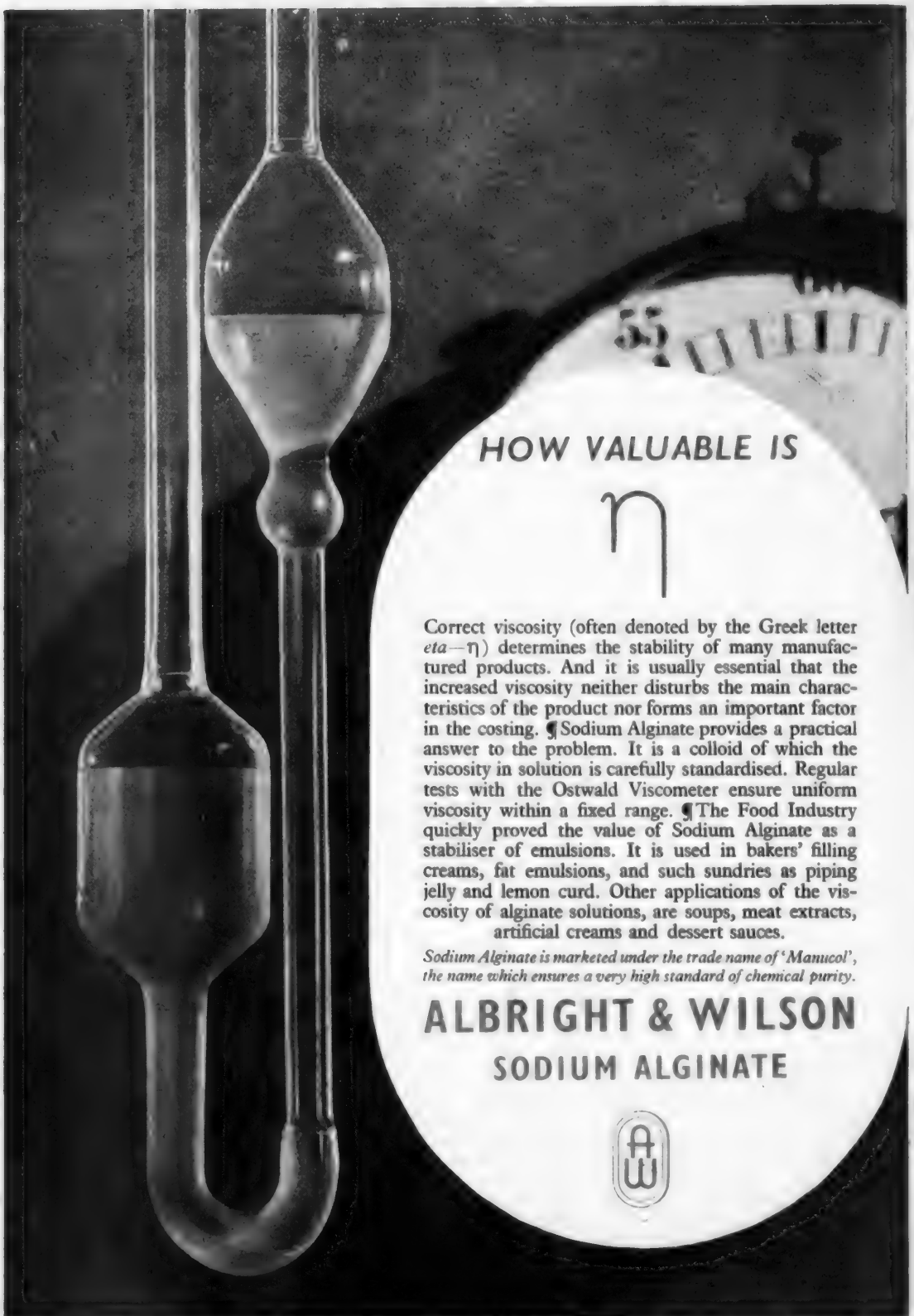
Why? Because the value of an adhesive is based — not upon its almost insignificant unit cost, but upon the final sales protection it gives to your product.

You can rely on National . . . with its long practised specialised skill . . . to give careful attention to every factor of your adhesive problem. Your inquiry is invited—NOW!

National ADHESIVES

NATIONAL ADHESIVES LIMITED
SLOUGH . BUCKS.
Tel.: SLOUGH 23344

EVERY TYPE OF ADHESIVE FOR EVERY INDUSTRIAL USE



HOW VALUABLE IS

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Correct viscosity (often denoted by the Greek letter *eta*—η) determines the stability of many manufactured products. And it is usually essential that the increased viscosity neither disturbs the main characteristics of the product nor forms an important factor in the costing. ¶ Sodium Alginate provides a practical answer to the problem. It is a colloid of which the viscosity in solution is carefully standardised. Regular tests with the Ostwald Viscometer ensure uniform viscosity within a fixed range. ¶ The Food Industry quickly proved the value of Sodium Alginate as a stabiliser of emulsions. It is used in bakers' filling creams, fat emulsions, and such sundries as piping jelly and lemon curd. Other applications of the viscosity of alginate solutions, are soups, meat extracts, artificial creams and dessert sauces.

Sodium Alginate is marketed under the trade name of 'Manucol', the name which ensures a very high standard of chemical purity.

ALBRIGHT & WILSON

SODIUM ALGINATE

ALBRIGHT & WILSON LTD · 49 PARK LANE, LONDON, W.1 · WORKS: OLDBURY & WIDNES

COMMER

Superpoise

25 CWT. MODEL

Illustration depicts 10′ 2″ wheelbase model with 9′ 0″ × 4′ 10″ × 4′ 6″ body.

SALIENT FEATURES

- ★ Four-cylinder engine with detachable liners develops 40 b.h.p.
- ★ Robust four-speed gearbox.
- ★ Fully floating spiral bevel rear axle.
- ★ Duo-servo brakes in large drums have braking area of over 200 sq. ins.
- ★ Well sprung and amply tyred.
- ★ Very complete equipment.

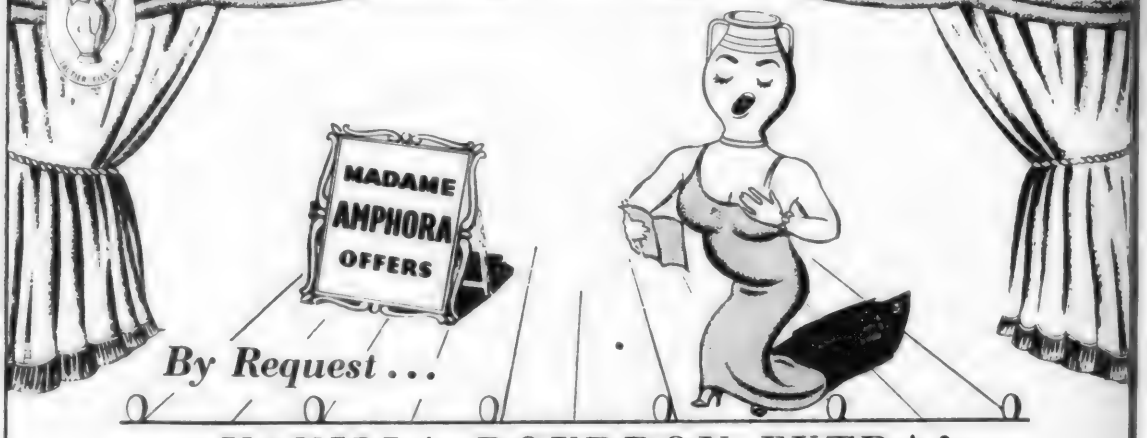
For long life and trouble-free running, this lively four-cylinder model challenges comparison with anything in its class.

A PRODUCT OF THE ROOTES GROUP

COMMER CARS LTD. LUTON BEDFORDSHIRE

LAUTIER FILS LTD

MAKERS OF THE FINEST FLAVOURS AND COLOURS
POWER ROAD, CHISWICK, LONDON, W.4



By Request . . .

VANILLA BOURBON EXTRA!

A delicious rich mellow flavour for cakes, fillings, ices, etc. Samples with pleasure.

Telephone : CHIswick 1441 (5 lines) Telegrams : LAUTIERFIS, LONDON

Illustration shows Reversible SLAT TYPE CONVEYOR suitable for handling general goods, including Sacks, Bags, Boxes, Bales, Cases, Drums, Coils, etc.

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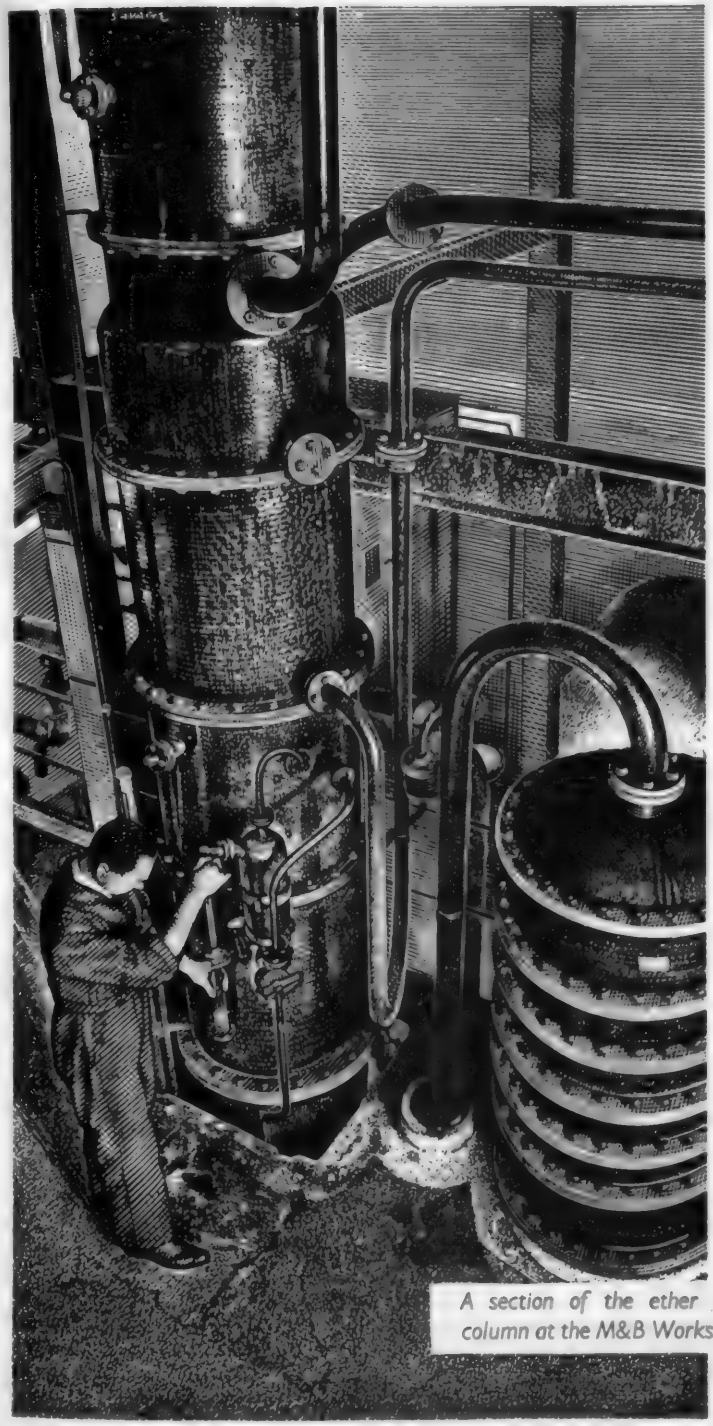

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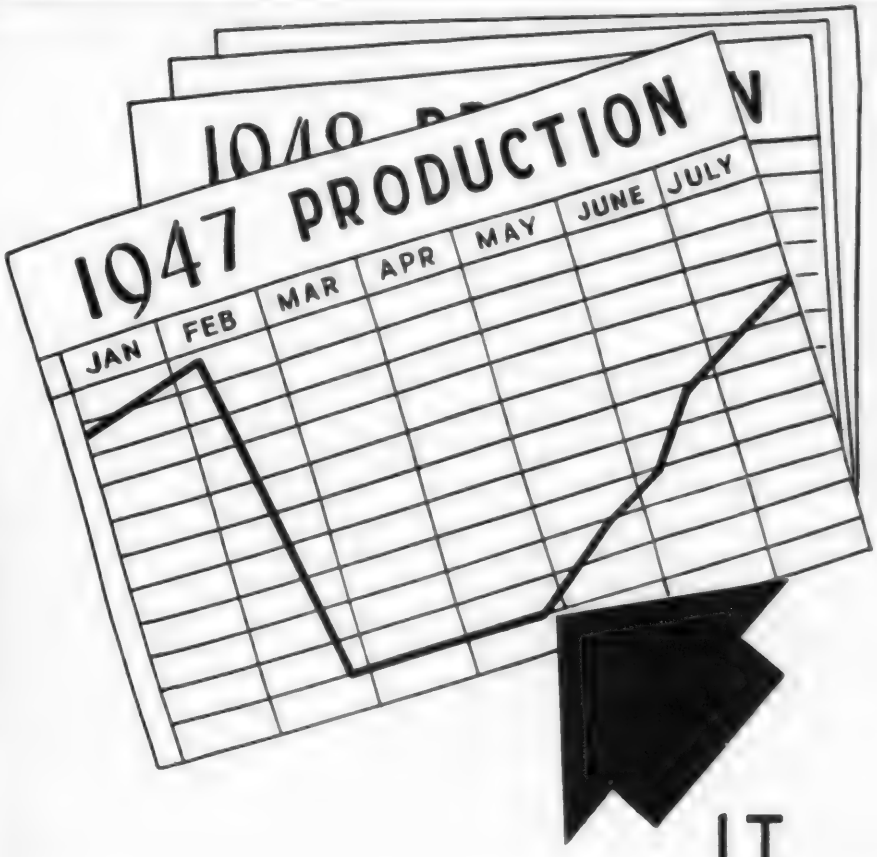

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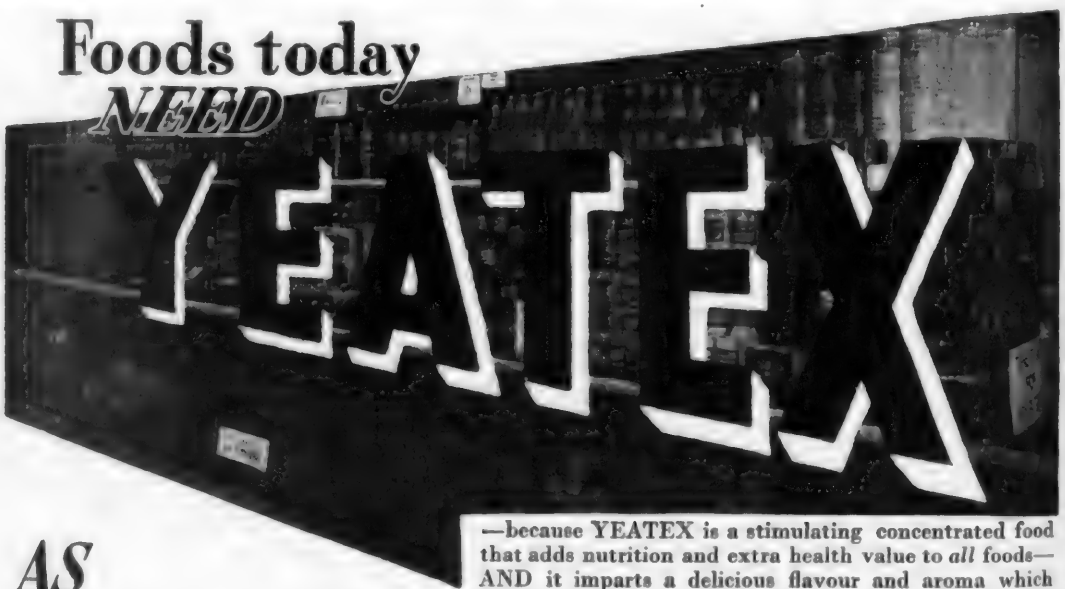

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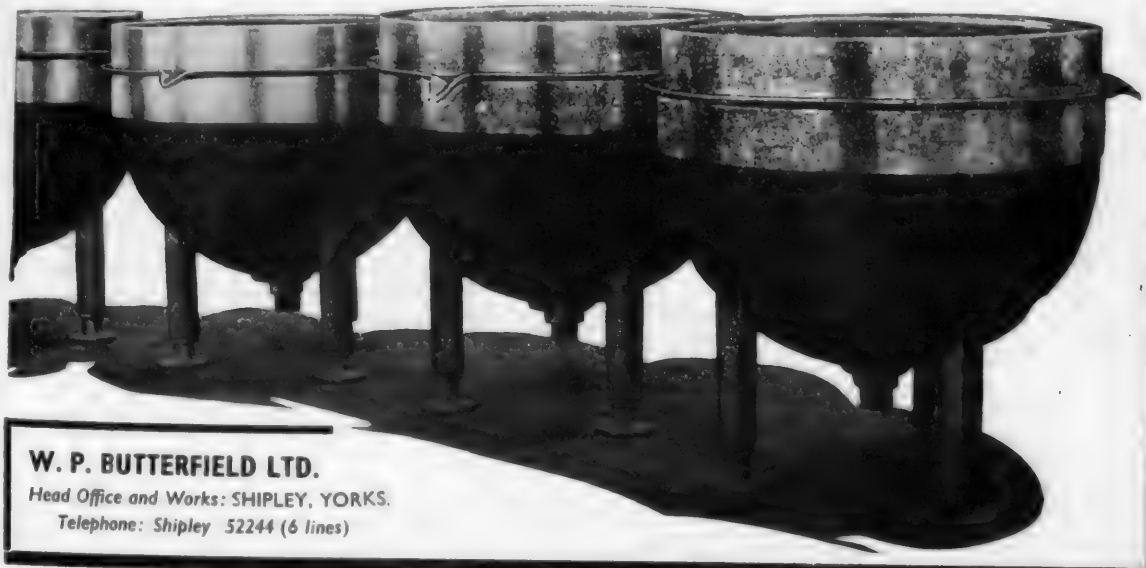

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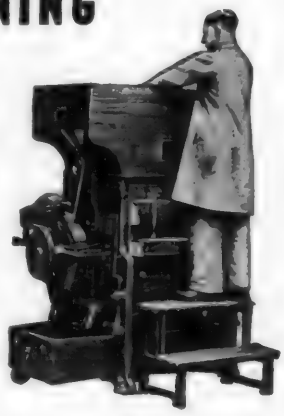

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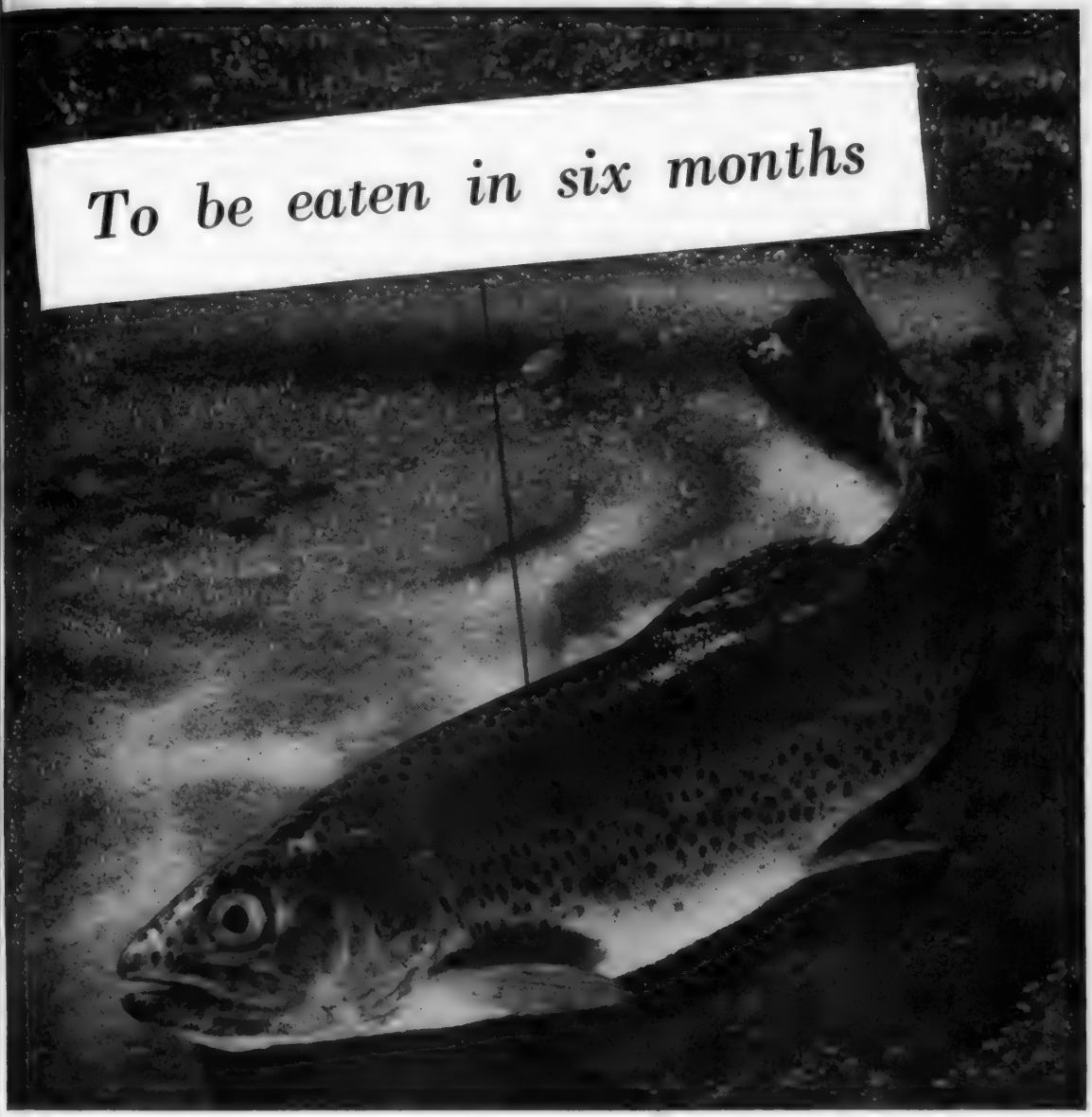

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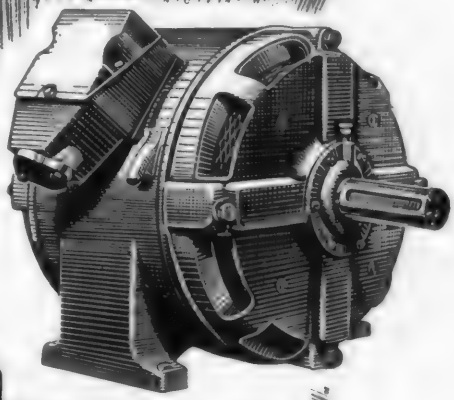
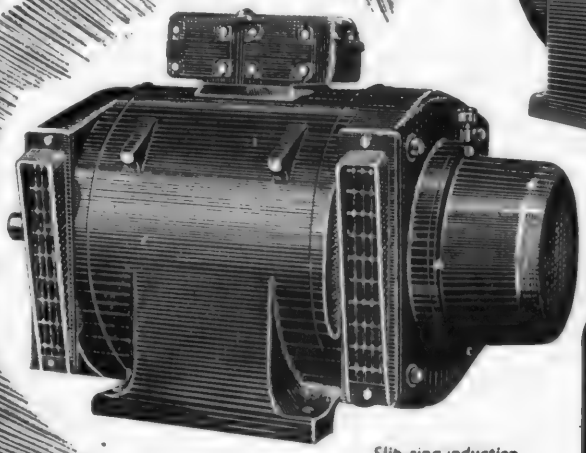
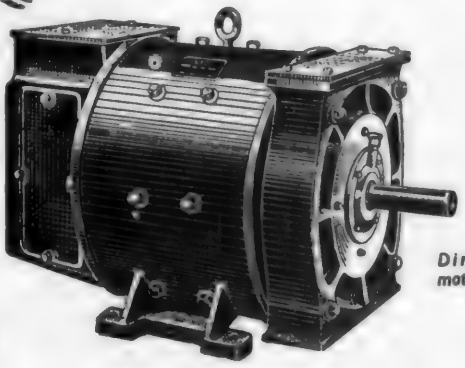


Squirrel-cage induction motor, protected type.



Slip-ring induction motor, drip-proof type.



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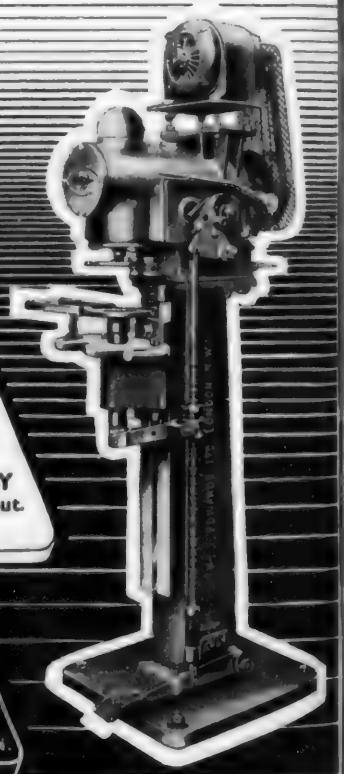

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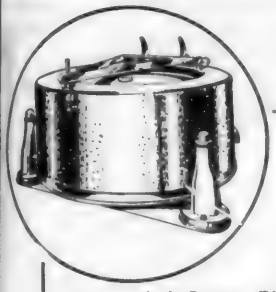
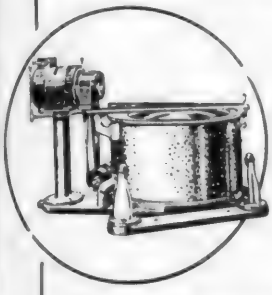
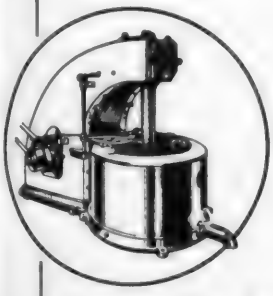


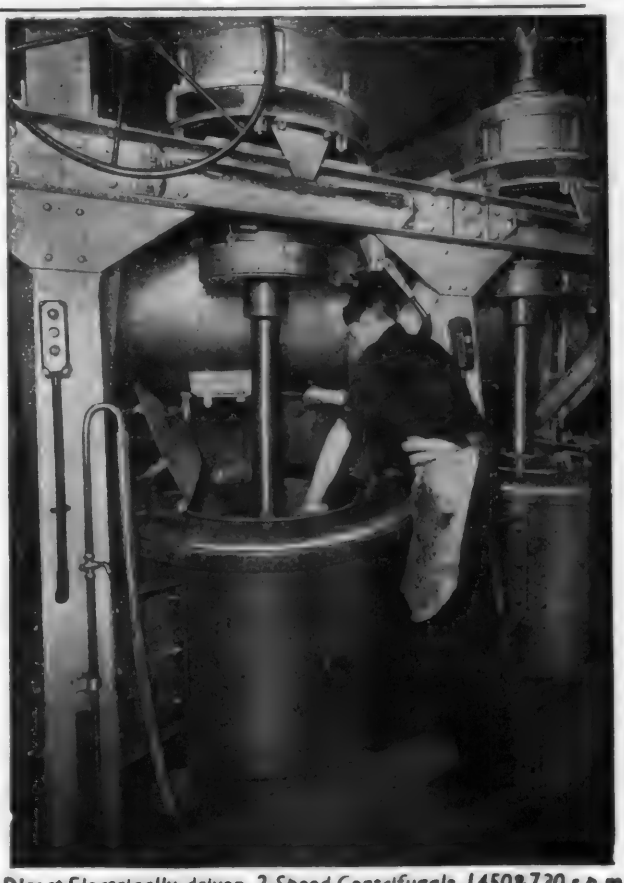
Suspended, Direct Electrically-driven



Suspended, Separate Motor-driven



Swan-neck Type, Belt-driven



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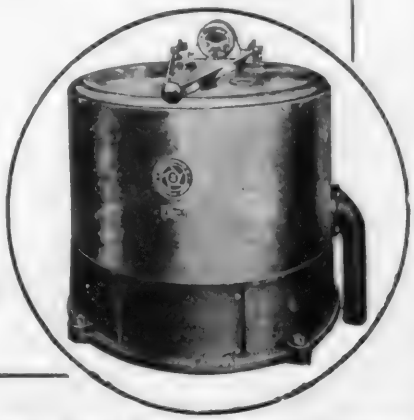

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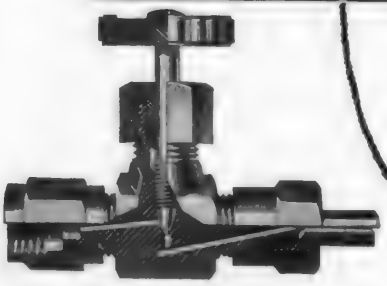

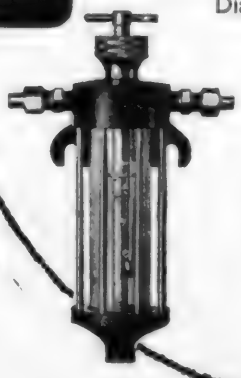

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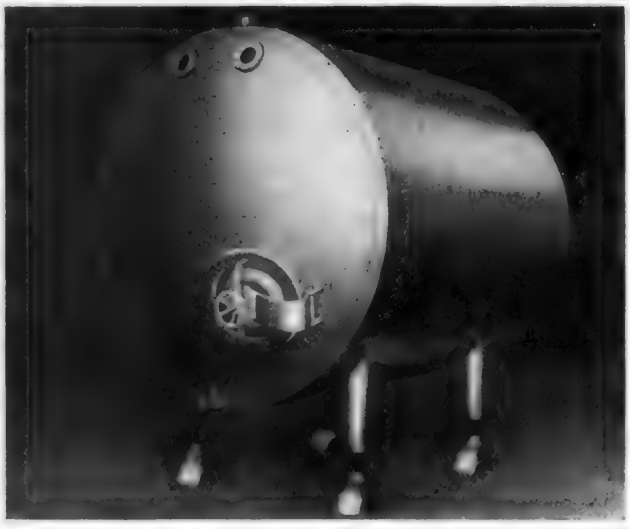

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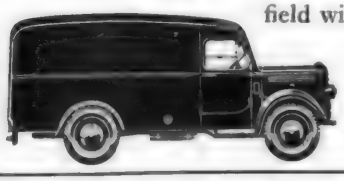

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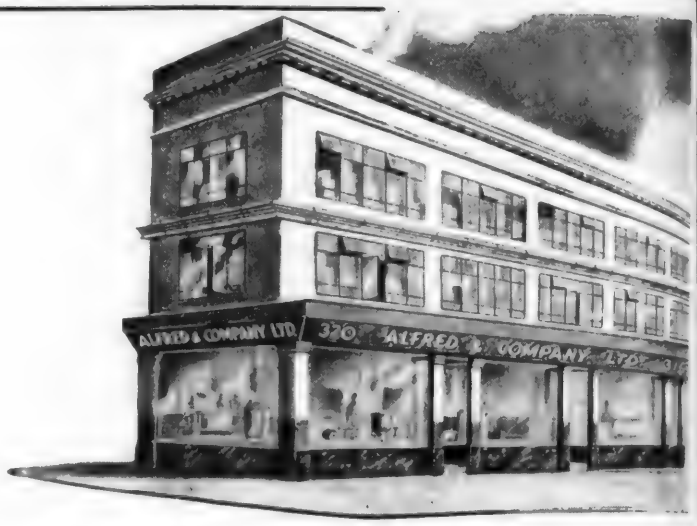

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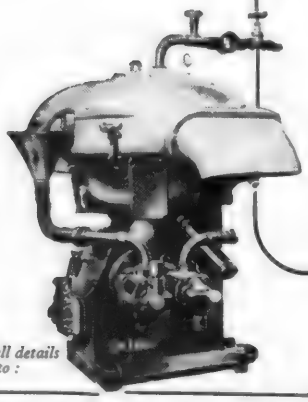

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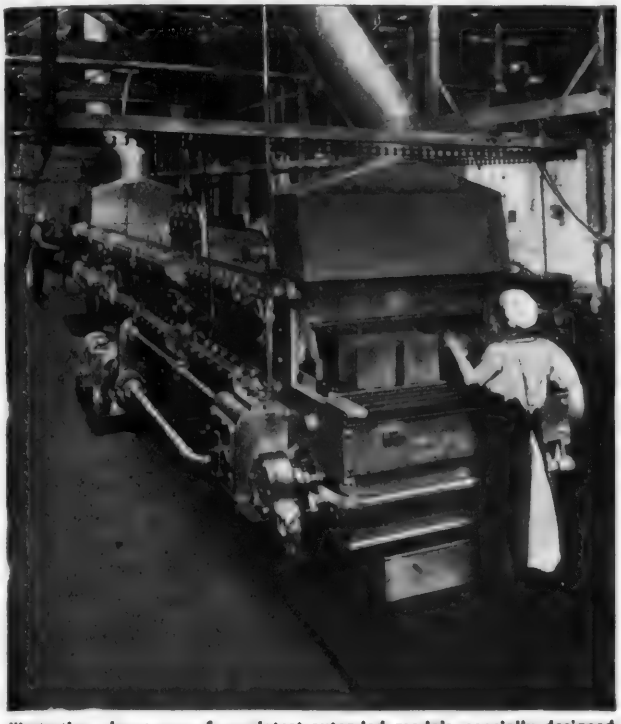

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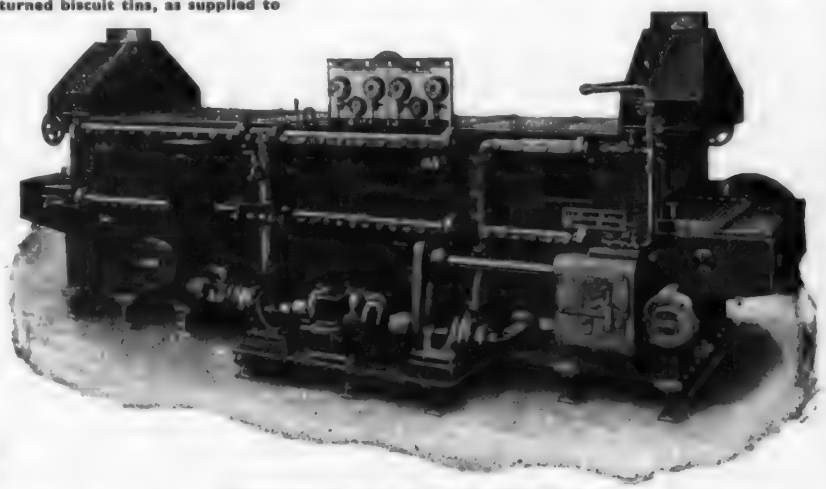

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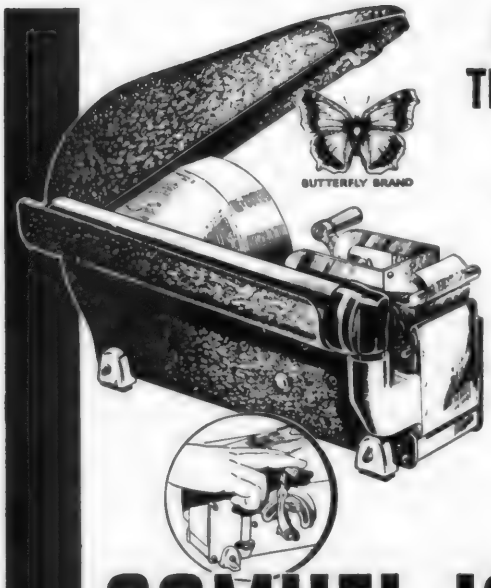

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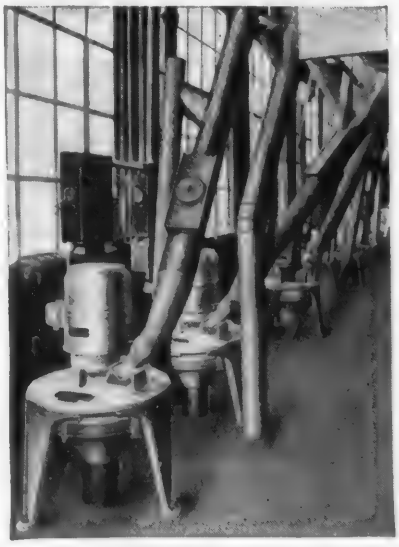

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FOOD MANUFACTURE

Vol. XXII. No. 10 · Published Monthly · October 1, 1947

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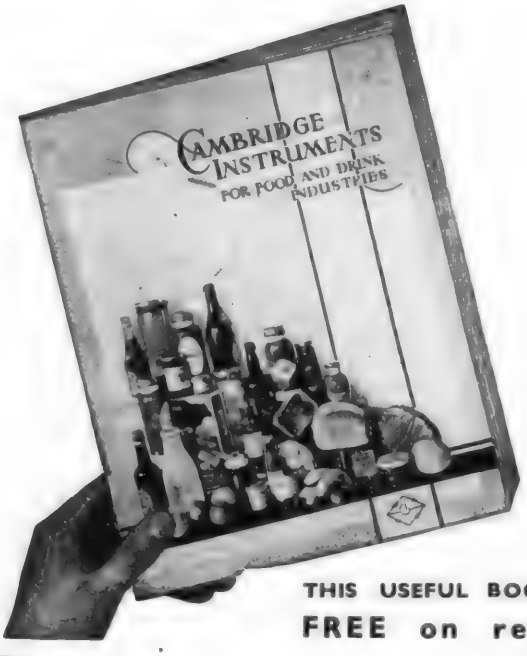

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FOOD MANUFACTURE

Vol. XXII, No. 10 October 1, 1947

New World Food Council

A DECISION of world-wide importance was made in Geneva on September 11, when, at the final plenary session of the FAO, it was agreed to set up an eighteen-nation World Food Council to replace the present Executive Committee as FAO's governing body. This will be an advisory body designed to aid in co-ordinating national and international policies in relation to food, and its members will all be spokesmen of their respective governments.

The Council's main duties will be: 1. To examine developments in inter-governmental agricultural agreements. 2. To co-ordinate national and international policies in relation to production, distribution, and consumption. 3. To promote the study of critical situations and recommend international action to improve them. 4. To advise on emergency measures for the export and import of food or materials needed to carry out national programmes of agricultural development.

Bread Rationing

Speculation continues as to how long bread rationing will continue. Much depends on the results of this year's world harvests, but a recommendation of the recent International Cereals Conference in Paris is significant. This was to the effect that no increase in bread or cereal rations should be authorised for importing countries unless such increases were necessary to satisfy minimum human requirements.

This recommendation received the unanimous support of the representatives of the forty nations, including Britain, that took part in the conference and will be considered by the Governments of the various countries. If this recommendation of the conference be acted upon, it is difficult to see how bread rationing in Britain can be brought to an end at an early date. It cannot be said that the present ration is insufficient to meet minimum human requirements.

Bread rationing has reduced flour consumption by 10 per cent. and it is generally believed that the abolition of the rationing scheme would result in increased consumption that would use up more than the quantity saved.

The Paris conference also recommended that prices of cereals should be adjusted so as to make the sale of cereals for human consumption more attractive to farmers than sales for feeding to livestock. In view of human needs far too much grain is fed to livestock in some countries.

Better Ice Cream

The allocation of skimmed milk powder to ice cream manufacturers was increased by 50 per cent. for the period ending December 31. For the first half of 1947 the allocation was equal to half the weight of sugar issued to a manufacturer; now it is equal to three-quarters of the weight of sugar.

Revision of formulae in consequence of the extra skimmed milk powder is a simple matter. The obvious course for a manufacturer to adopt is to use the ingredients in the proportions in which they are issued. In the past few months, manufacturers who have been using, say, 10 lb. sugar per 100 lb. of mix will also have been using 5 lb. skimmed milk powder. Now they will raise the skimmed milk powder content to 7½ lb. and omit 2½ lb. of "fillers," such as wheat flour, barley flour, and soya flour.

The quantity of skimmed milk powder now allocated is still below the datum usage and can be used without any risk of "sandiness" developing. Some firms that have been using lactose may, however, decide to reduce the quantity of that ingredient. Skimmed milk powder contains about 53 per cent. lactose, too much of which is a cause of sandiness.

It is impossible to foresee the position regarding skimmed milk powder after December 31. The dollar crisis may affect supplies, as most of the powder has come from U.S.A. since the war. In pre-war days Holland was a principal supplier.

The decision of the Ministry of Food to grant allocation of ingredients to ice cream manufacturers who in May, 1940, failed to establish their datum usage of ingredients (especially sugar) is not working to the entire satisfaction of the trade.

The Ministry has received a surprisingly large number of applications, which is evidence of the hardship suffered by a large section of the trade, but has decided, however, that in cases where a business has changed hands since 1939 the allocation cannot be granted to the new owner of the business. This decision has been made on the pretext that the Ministry has insufficient sugar, and it means that a large number of pre-war ice cream plants must continue to remain idle.

Thought for Food

In the Eastern world the pattern of daily diet is the bowl of rice to which oddments and snippets of other foods are casually added. In Eastern Europe a stew or soup takes the place of the bowl of rice, and relatively large quantities of bread become a complementary part of the dietetic formula. It should be remembered that 75 per cent. of mankind follow these simple eating customs, whereas our own diet pattern is complex and diverse, based upon abundant supplies of imported meat, fats, sugar, fruit, and a range of cereals. The bowl-of-rice-or-stew formula is much more adaptable to such grim conditions as world food shortages or world dollar shortages: in such countries the task of a Ministry of Food is mainly confined to ensuring the supply of a few staple foodstuffs. But with our traditionally rich and diverse diet the Ministry of Food must constantly maintain "a precarious balance between a large number of foods in short supply." These points are made by Mr. F. le Gros Clark in an article in *Discovery* (August, 1947) in which he analyses the customary British idea of a good diet and discusses our chances of ever getting back to it. Mr. le Gros Clark presents the realistic picture that somehow or other politicians must "put over" to the public, though there are few signs that the public is sufficiently interested in cold analysis and logic where their daily food is concerned.

Mr. Clark thinks we are unlikely to see the end of rationing and other limiting controls for many years. In his view it is not by any means a matter of getting back to pre-war import figures for various foodstuffs. Our population is 5 per cent. larger than it was in the mid-thirties, and moreover it is proportionately more adult, a factor that is increasing each year. But in the mid-thirties consumption of the principal foodstuffs varied considerably between different income-groups, as Sir John Boyd Orr's surveys of the time demonstrated. Today income groups have come much closer—indeed it might be said that the pre-war lower working-class group has disappeared. With prices of basic foods controlled and subsidised, the potential demand for them is far higher than the actual and total consumption of 1935 or 1936. Mr. Clark calculates that any return to the full British pre-war diet without quantity rationing *per capita* would require 11 per cent. more sugar, 14 per cent. more meat, 10 per cent. more fats, and 10 per cent. more fruit than was consumed per annum in the 1934-38 period. But these figures are more formidable when presented against the background of our consumption in a war-time year of rationing; they represent increases on our 1944 supplies of 48 per cent. for sugar, 19 per cent. for meat, 22 per cent. for fats, and 100 per cent. for fruit! There is no doubt that we must develop a new pattern for our diet, a pattern based upon a plentiful supply of certain foodstuffs. This involves a grand and long-term food plan, a vast expansion of our own agriculture coupled with the development of new food sources abroad. At home we must look to dairy herds and milk and cheese for increases in animal protein, and gradually we must be able to look to Africa for more vegetable oils, sugar, fruit, and feedingstuffs for our cattle. "It is preferable to have an unlimited supply of margarine than a parsimonious ration of butter. It is preferable to work hard at fresh sources of production than wait like pensioners for the dollar market to shift in our favour and for the world to consent again to feed us in the way to which we had grown accustomed." But it is one thing for Mr. le Gros Clark to explain these grim matters to well-trained minds; the question arises as to how they can be explained to the average rationee so that in the meantime he will endure austerity with patience and impartiality.

Harvests: 1947-1948

As the position of the 1947-1948 harvests becomes clear, it grows only too obvious that the world has to face another difficult year. The estimated exportable surpluses from the main exporting countries will amount to about 25 million

tons of wheat and about 5 million tons of coarse grains. It is significant that more than 27 million tons of all these grains will have to be derived from the dollar countries; the proportion may finally turn out to be even higher. The expected Australian surplus will probably be less than 2 million, and may not be more than 1·5 million tons.

The Argentine harvest will not be larger, by all indications, than that of 1946-1947. As a result the shipments can scarcely be higher; for Argentina, like all the exporting countries, has been hampered by transport difficulties and inadequate loading facilities at the docks. Moreover, there has been of recent years a definite tendency to discourage cereal production; and this tendency has been intensified through the impression gained by the Argentine farmer that he was receiving a disadvantageously poor price for his produce. In other words, the benefit from high world prices was being reaped less by the primary producer than by the Government and the intermediate agents.

It has been noted that the carry-over stocks held both in Canada and the U.S.A. are extremely low; the general belief is expressed that neither country would agree to continue for a further year the dangerous practice of holding very low stocks. Again, though the wheat harvest in both countries is good, the harvest of oats and maize is distinctly poor. In other words, since there was a considerable shipment of maize from the U.S.A. during the last year, the total shipment of all grains in the current year may actually be far lower than it was in 1946-1947. The rise in maize prices is making it less advantageous to use maize instead of wheat for stock-feeding; and as a consequence the poor maize harvest may even cause the diversion of wheat to stock-feeding, unless steps are taken by the Government to retain the wheat for human consumption. Measures of this kind are not likely to be taken in the U.S.A. during an election year. A further factor influencing U.S.A. shipments through 1947-1948 will be the harvest expectations in the spring of 1948. The U.S.A. has had six years, during the last two decades, when her own wheat production was less than domestic requirements. If, in the spring of 1948, the country is threatened with another unfavourable harvest, shipments are bound to fall off at a time when the importing countries of Europe and Asia will find their situation most difficult.

It is hoped that the importing countries may pick up another 2·5 million tons from such countries as Brazil, Turkey, the Middle East, and the U.S.S.R. But this estimate is entirely conjectural. The Soviet surplus, if any exists, will undoubtedly be disposed of where the political benefits are felt to be most evident; that is to say, it will go primarily to fill up gaps in supply that appear in the East European countries, although there may be a quantity to spare for Britain or France.

In face of these prospects it can only be hoped that some of the estimates put forward by the importing countries will turn out to be excessive. Obviously the Australian surplus, coming as it does from a sterling country, will be in considerable demand. But difficulties will arise. The Indian Government is clearly anxious to secure as large a proportion of the Australian crop as possible. The danger is that in parts of India serious famine situations will emerge from time to time; and as these fissures appear in the Indian food administration, it will be indispensable for the new Government to control a reserve stock of several hundred thousand tons, from which relief shipments can immediately be despatched. The indications are, however, that there exists an agreement between the British and Australian Governments for the sale of most of the exportable surplus to our own Food Ministry.

Finally, transport is likely to be one of the major problems. Can all this vast quantity of grain be shipped about the globe during the coming year? If so, some control of transport will probably be necessary; and it is doubtful whether any effective control is likely to be imposed.

Spray Dried Egg and Food Poisoning

Reference was made in the May 1947 issue of FOOD MANUFACTURE to the work carried out by various workers in connexion with spray dried egg as a source of infection. It was not until July 1942 that the first retail distribution to the public began. Dried egg was a new source of food and very little information was available as to its bacterial content.

During the examination of the new product in August 1942, the presence of bacteria belonging to the *Salmonella* group—organisms that were known to give rise to food poisoning in man—was revealed. This was a disturbing finding and led to the drawing up of urgent recommendations to

the bakery, confectionery, and catering trades and to the retail consumer by the Ministry of Food, calculated to diminish the incidence of food poisoning arising from the consumption of the new product.

A report by various authors issued by the Medical Research Council (Special Report Series No. 260) tells the sequence of this decision and shows how, although outbreaks of food poisoning due to salmonella infection were not wholly avoided, it proved possible by the various educative and restrictive measures introduced to minimise their extent and curtail their severity.

The report in question includes details of a number of investigations by four different sets of workers. Two of the reports are concerned with the bacteriology of dried egg and salmonella infection in man associated with its consumption. The predominant bacteria in dried egg are enterococci and aerobic-sporing anaerobes, coliform organisms being present in every sample but only in small numbers. Of 7,584 samples examined, 754 or 9·9 per cent. were found to contain organisms of the *Salmonella* group.

Thirty-three different *Salmonella* types were isolated, six of which most frequently occurred, and all were new strains not previously found in this country or associated with salmonella disease. The new strains are: *Salm. oranienburg*, isolated 245 times; *Salm. montevideo*, 139; *Salm. meleagridis*, 117; *Salm. tennessee*, 90; *Salm. bareilly*, 82; and *Salm. anatum*, 80 times. The most common food-poisoning strain, *Salm. typhimurium*, was also isolated from 80 samples.

The comparatively recent adoption of dried egg as a food, and communal feeding as a new habit, involve the additional risk of infection from contaminated food, and we have not in this country given as much attention to this matter as have the Americans. Dr. Hutchinson, in a recent survey of twenty-five kitchens in communal centres (*B.M.J.*, 1947, 1, 184), recorded the results of her investigations of the general hygienic condition of the equipment in daily use by the public. Her findings showed that the cleaning of eating utensils was very unsatisfactory and that pathogenic organisms were likely to be spread among the users of different articles.

It is evident from the four reports that there is a risk of food poisoning from dried egg. In the appendix by the Ministry of Food an attempt is made to weigh up the potential risks against known advantages and the view is taken that there was a very strong case for importing dried egg powder in view of its high protein content and calorie value in comparison with such things as boneless beef, corned beef, and dried separated milk. The Ministry concludes that "if dried egg is *effectively* cooked immediately after reconstitution, the risk of salmonella infection therefrom does not arise."

Provided therefore that the propaganda issued by the Ministry is adhered to by those concerned in the preparation of food, no risk is present. Where the risk does lie is in the reliance placed by the consumer on the preparer of his food, and he must choose between denying himself the benefit of a highly nutritive food, or taking a chance and trusting to the complete efficiency of the food preparers which, according to Dr. Hutchinson's findings, does not exist.

Hedgerow Harvest

Looking back on summer and all the sun provided, a noteworthy point was the glut of blackberries bordering our fields and rivalling the glut of fruit in the shops. "We hunt the sweet berry with purple-stained ardour." That line of E. V. Lucas sums up the effort to get something for nothing, to gather a hedgeside harvest free for all, the only coupons required being those for replacing clothing damaged in the prickly scramble. The blackberry or bramble, *Rubus fruticosus* to the botanist, is both British and American, with species and hybrids so numerous as to include such examples as Judge Logan's loganberries among near relations. But while the American cousin goes in for culture, wild blackberries for wild Britain is our motto. Our nation's literature naturally shows how typically a part of our countryside of field and hedegrow is this thrusting plant. Matthew Arnold saluted

These English fields, this upland dim,
These brambles pale with mist engarlanded.

As for Will Shakespeare, quite a few of his characters refer to its largesse: as in Falstaff's two similes in his chirrupings to Prince Henry and the Hostess, and in Thersites' "not worth a blackberry" in *Troilus and Cressida*.

But it is far older than this, as witness Sir Arthur Keith's *Antiquities of Man*, which relates how among the ribs of a skeleton of Neolithic woman in Essex was nearly a pint of blackberry and rose hip seeds, indicating either a last meal or that food had thus been provided for her journey after death.

A Model Bakery

The story of Clark's Bread Co., Ltd., the prosperous concern which supplies bread and confectionery to almost the whole of Sussex, and which celebrated last May its diamond jubilee, is an uncommon one.

MORE than sixty years ago a market gardener who was interested in artificial manures attended a school of art to take lessons in agricultural chemistry from a mining engineer, the late Ald. W. Jago of Hove. One of his early pupils was that market gardener, the late J. J. Clark, who at that time owned a dairy farm at Patcham and a market garden at Hove. The story runs that Mr. Clark complained to his professor that he could not obtain bread to his liking and they decided to start a bakery in Hove. Mr. Jago being a scientific man, and Mr. Clark having acquired from his teacher a scientific angle of view, it was decided by these enterprising pioneers that their new bakery be installed with the very latest plant and equipment then available. It was then that rapid progress was being made in an industry where methods had not changed materially from biblical times. There is very little difference between the Roman way of making bread and that of today, except in the matter of plant and equipment. Pliny gave details of Roman bread making, and there are interesting remains of a bakery in Pompeii and also in the tomb of a baker named Eurysaces, which was built about 50 B.C., some 120 years before Pliny wrote his *Natural History*.

Rapid Progress

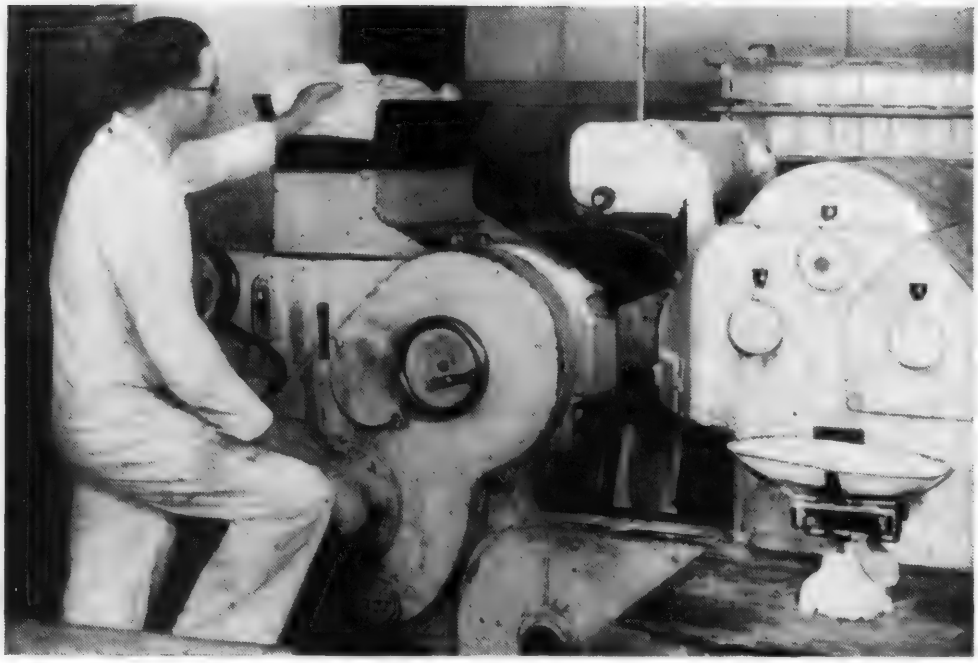
The Hove bakery proceeded from strength to strength. In 1899 the Royal Sanitary Institute of Great Britain awarded the firm a special medal for improvements in bread making.

In 1893 a private company was formed to take over this bakery business. From its inception it was renowned for its progressive methods and improvements in bread making. In 1931 the firm of Gigins, Ltd., with its bakery and branch shops, was taken over and is now a subsidiary company. The firm is now a public company with Sir James Hawkey as chairman of directors, two members of the Clark family being on the Board. Mr. J. C. Smith is general manager.

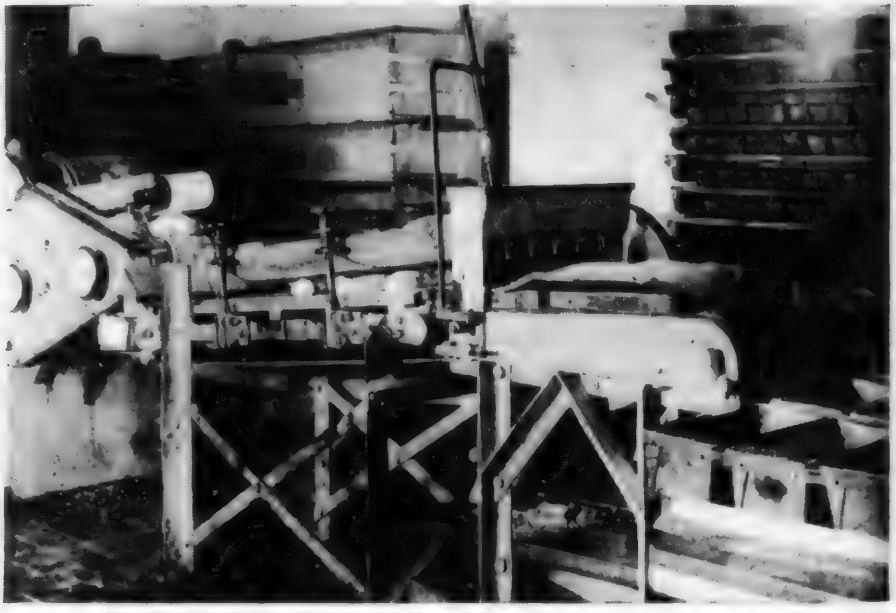
The operations follow the usual routine, but the impression gained by a visit to the bakery was of its individuality. Every department is "streamlined," and exhibits evidence of careful organisation and efficiency.

In the various departments it was possible to meet old operatives with from thirty to forty years' service. Mr. Charles Kingston, 68 years of age, has been working in the dough mixing department since 1909, and takes a pride in the thought of the number of loaves that he must have helped to make for the feeding of his fellow-citizens.

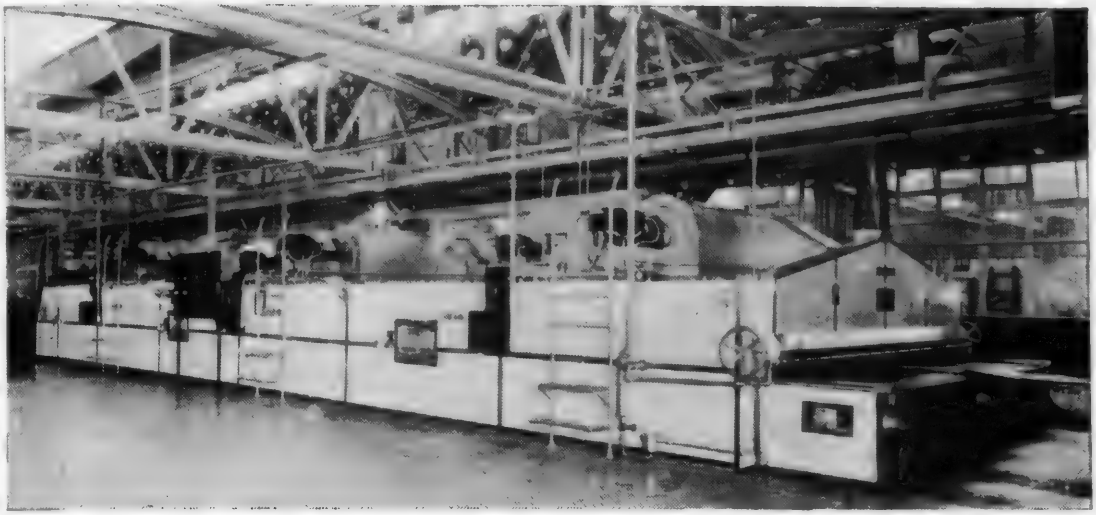
After the mixing operation the dough is released into metal-lined troughs. *Photo. Leonard Hill Ltd.*



The dough is fed into the dividing machine, which cuts, divides, and weighs the dough ready for the oven.



The dough is extruded into the tins, where it has its final proof of forty-five minutes.
Photos. Leonard Hill Ltd.



The travelling ovens are gas-fired, electrically driven, and synchronised to adjust the baking time from thirty-five to forty minutes. *Courtesy Baker Perkins, Ltd.*

This bread-cutting machine cuts forty-eight slices at a time.
Photo. Leonard Hill Ltd.

Flour Store

The first department visited was the flour store. Flour, supplied by various millers, is brought by hoist to this department and is fed into blenders, whence it is conveyed to the sifters by which foreign matter is removed.

The Dough-Making Operation

The blended and sifted flour, to which water, salt, and yeast have been added, enters the dough mixers through hoppers. Two types of mixers are used, one driven by a gas engine and a more recently installed one driven by electricity. After the mixing operation, which is completed in twenty minutes, the dough is released into metal-lined troughs and conveyed to the fermenting room where it is left for three hours.

One of the pastry mixers in the confectionery department.
Photo. Leonard Hill Ltd.

The next stage is the hander-up and first proving. The dough is fed into the dividing machine which cuts, divides, and weighs the dough ready for the oven. The prover consists of a conveying column carrying rows of containers into which the pieces of dough have been deposited to an overhead chamber where they are allowed to prove for fifteen minutes in their own heat.

From there the dough undergoes the moulding and shaping process where the loaf is fashioned into the desired shape with an unbroken skin. The machines can be switched over to handle either tin loaves or round loaves. The dough is extruded into the tins where it has its final proof of forty-five minutes.

With a capacity of 2,000 open tarts per hour, this machine shapes and fills them with jam without being touched by hand. *Photo: Leonard Hill Ltd.*

Cakes and tarts ready to go into the ovens.

The Baking Process

The dough is now ready for the travelling ovens, the latest type of which has been recently installed. These are gas-fired, electrically driven, and synchronised to adjust the baking time from thirty-five to forty minutes. The loss of weight occurring during the baking process is provided for by the automatic adjustment of the original weight. For instance, dough weighing 2 lb. 1 oz. on entering the oven emerges as a loaf weighing 1 lb. 15 oz., and a further loss occurs during the cooling operation. On emerging from the oven, the loaves are transported by conveyor belt from the oven to the

A cake receives its final touches in the finishing department.

Photos: Leonard Hill Ltd.

cooling-room, the finished weight of the cold loaf being 1¾ lb.

A separate section is the Vienna bakery where bread rolls are made. Here the ovens heated by coke, fired at the back, are used, and the rolls are placed into the ovens by means of peels or slips. The baking being complete, they are scooped out into containers and transferred to the cooling-room. Two shifts are being worked in both sections.

Confectionery Department

An attractive assortment of all kinds of pastries, pies, and Cornish pasties is prepared in the confectionery department, different mixing operations being employed according to the finished product desired. Some of the mixing operations are two-stage ones, the eggs and sugar being placed in one mixer and the fat and flour in another.

An ingenious machine in this department, having a capacity of 2,000 open tarts per hour, shapes them and fills them with jam without being touched by hand. For the use of sponge mixtures and similar articles a battery of closed-in ovens (peel ovens) is used, while drawplate coal-fired ovens are used for the general types.

A separate department deals with the finishing and decorating of fancy products such as cream buns, iced cakes, trifles, *gateaux*, and French pastries.

A well-equipped jam manufacturing section adjoining the confectionery department supplies its entire needs.

The Bun Bakery

A separate section is concerned with the baking of buns, scones, and general confectionery items.

A further section is the flour-packing department in which flour is packed into 1 lb. and 3 lb. bags for the retail trade, and the despatch floor is a hive of activity whence a constant stream of freshly made products pours into the Company's forty-three retail shops, twelve of which have café-restaurants annexed.

In common with other industries, the Company is feeling the pinch of present-day scarcity of materials and labour. Whereas pre-war some 300 varieties were produced, now there are only about thirty.

Maintenance of plant and machinery is carried out by a permanent staff, and in the Company's engineering shops not only repairs are carried out but special machines or those unobtainable today are designed and built.

The Company, not content with present progress, purposes important extensions to the existing premises.

The welfare of the personnel is provided for by kitchens, canteens, and first-aid facilities.

SUPPLIERS OF EQUIPMENT TO CLARK'S BAKERY CO., LTD.

Travelling ovens, dough mixers, blenders, dough dividers: *Baker Perkins, Ltd.*
Weighing machines: *Parnall and Sons* and *W. and T. Avery, Ltd.*
Sealing machines: *Southall and Smith, Ltd.*
Pie-shaping machines: *John Hunt, Ltd.*, and *C. O. Ericsson Engineering Works, Ltd.*
Pastry roller: *Pelkman Bros., Ltd.*
Crumbing machines: *Morton Machine Co., Ltd.*
Mixers: *C. O. Ericsson Engineering Works, Ltd.*
Refrigerators: *Frigidaire, Ltd.*, and *J. and E. Hall, Ltd.*
Boilers: *J. Hickey and Sons, Ltd.*, and *Baker Perkins, Ltd.*
Delivery vans: *Wilson Electricars* and *Morrison-Electricars* (*Crompton Parkinson, Ltd.*).
Petrol vans: *Austin Motor Co., Ltd.*, *Ford Motor Co., Ltd.*, and *Morris Motors, Ltd.*

Storage and Distribution of Fruit

THE problems involved in the correct care of fresh fruits and vegetables up to the time they are purchased by consumers are now receiving consideration by wholesale dealers in the large distributing centres in Canada.

Wholesale dealers are generally looked upon as the main distributors of these fresh and perishable products, but actually distribution begins in the orchard when harvesting starts and ends when the fruit reaches consumers. The excessive wastage which often occurs during distribution consequently affects both primary producers and ultimate consumers, as well as every other group concerned with the distribution. For these reasons, attention is being given to distribution and storage problems, as wholesale dealers realise that their customers should have improved facilities for handling these products and a better understanding of their storage requirements. Even when the product has reached the final outlet in the chain of distribution at the retail store, consumers, too, could obtain better satisfaction by more intelligent buying and by employing greater care in the storage and use of the commodity.

To obtain fruit of the best quality it must be picked at the right maturity. Prompt and careful handling from the orchard to a cold storage plant where the field heat can be quickly removed helps to maintain quality and preserve the condition.

Storage Methods

Fruit is actually in storage the moment it is picked regardless of where it is held. It has a definite storage life and at high temperatures that life rapidly passes. Under refrigeration the life and

condition of fruit is conserved, but different kinds and varieties react differently to low temperatures and so must be treated accordingly.

Pears, for example, should be cooled and stored at 31° F., but to be properly ripened a temperature of 65° to 70° F. with a high relative humidity is required. The earlier varieties of all fruits have a much shorter storage life than the later ones. Thus the Bartlett pear has a storage life of eight weeks, while the Anjou pear, picked four to five weeks later, has a life of about sixteen weeks. It is the late and not the early varieties of fruit that are kept in cold storage at 32° F. for the longest time. Peaches and other stone fruits are generally precooled, as they do not respond well to cold storage except for a very short time at 32° F., and then they should be ripened at room temperature with a free circulation of air.

All stone fruits are susceptible to mould growth and rots, especially if confined in warm, moist air. They need good ventilation, and it has often been recommended that fans be employed to force a current of air through stacks of peaches, prunes, or other stone fruits.

Apples and pears do not require air circulation except for the purpose of refrigeration in cold storage. Exposed to ordinary room temperatures for any length of time these fruits may soon become over-ripe, shrivel, and begin to lose flavour.—*From "Experimental Farm News," Dept. of Agriculture, Ottawa.*

Social Service Legislation

WHEN the Beveridge scheme was first proposed, it was widely felt that, whatever might prove to be the political complexion of the party in power in this country after the war, the fundamentals of the scheme at least would be retained and implemented. For all parties were visualising a post-war term—it was hoped, a long-term period—of full employment, due to the need for the whole world to repair war's ravages and restore its shattered industries.

The need, of course, remains unaltered, but the efforts that have been made towards supplying it have as yet hardly resulted in that state of prosperity (in this country at any rate) which inspires thoughts of benign social legislation.

However, the economic crisis in which we now find ourselves was delayed a sufficient length of time to enable the present Government to give effect to the scheme in its main outlines.

For the National Insurance Act and the National Insurance (Industrial Injuries) Act, both of 1946 (and citable together as the National Insurance Acts, 1946), are the Beveridge scheme for practical purposes.

These Acts are now the law of the land and must be operated. Whether the country can "afford" the advanced social legislation that they provide is a question which will be answered by each individual largely according to his political outlook. Some urge that such social-security legislation, by reassuring the worker as to his future and insuring him against sickness and unemployment, is calculated better than anything else to "pay dividends" in the form of harder work and increased output. Others hold that such security, at the stage at which we have it in this country, "dry-nurses" the worker, weakens his moral fibre, and more and more inclines him to depend upon the Government in respect of the usual hazards of life instead of upon himself.

Time will show how our *n*th degree social legislation will work out. If the country is submerged by economic blizzard next winter, it (and many other things) will have scant chance to do so: there will simply be no money to pay for costly services, however desirable and productive in the long run they may be.

Meanwhile the new Acts must be operated, and it is essential for all to be acquainted with the ground covered and what is required of them. For this purpose, a newly-published work* is indispensable. From it everyone can learn what he has to do, what to pay, and to what benefits he becomes entitled.

The Industrial Injuries Act sets up new machinery for dealing with claims in respect of injuries caused by accident arising out of and in the course of employment. That is to say, the Act supersedes the Workmen's Compensation Acts, and so insurance against risks of accident to workpeople will at long last be compulsory. Weekly rates of contribution (normally payable by one stamp with contributions under the N.I. Act) will be:

	Employer.	*Employee.*
	d.	*d.*
Men over 18	4	4
Women over 18 ..	3	3
Boys under 18 ..	2½	2½
Girls under 18 ..	2	2

Both Acts were passed to come fully into operation on an "appointed day." The actual date does not appear in the book, presumably because the latter was sent to press before announcement was made, but the date for both Acts is to be July 5, 1948. The first part of the N.I. Act, relating to retirement pensions, has been operative since the first week in October, 1946.—M. C. M.

* *The National Insurance Act, 1946.* By Douglas Potter, M.A. London. Pp. 269. Price 21s.

Ministry of Food

Latest Statutory Rules and Orders

The list given below is the continuation of the list of Orders published in *Food Manufacture*, September 1, 1947, page 394.

No.	*Date.* 1947.	PRICE FIXATION ORDERS
1512	July 17.	The Tapioca and Sago (Maximum Prices) Order. Revokes S.R. & O. 1941, Nos. 675, 983; 1942, Nos. 349, 494.
1535	„ 21.	The Wheat (Control and Prices) (Great Britain) Order. Revokes S.R. & O. 1945, No. 896; 1946, Nos. 1262, 1589, 1742, 2234; 1947, No. 1234.
1536	„ 21.	The Wheat (Control and Prices) (Northern Ireland) Order. Revokes S.R. & O. 1945, No. 899; 1946, Nos. 1262, 1589, 1742, 2235; 1947, No. 1234.
1538	„ 21.	The Rye (Control and Prices) (Great Britain) Order. Revokes S.R. & O. 1945, No. 895; 1946, No. 1263; 1947, No. 1234.
1539	„ 21.	The Rye (Control and Prices) (Northern Ireland) Order. Revokes S.R. & O. 1945, No. 875; 1946, No. 1263; 1947, No. 1234.
1574	„ 23.	The Oats (Control and Prices) (Great Britain) Order. Revokes S.R. & O. 1944, Nos. 789, 1091; 1945, Nos. 47, 876; 1946, No. 1260; 1947, No. 1234.
1575	„ 23.	The Oats (Control and Prices) (Northern Ireland) Order. Revokes S.R. & O. 1944, No. 856; 1945, Nos. 47, 877; 1946, No. 1260; 1947, 1234.
1636	„ 30.	The Barley (Control and Prices) (Great Britain) Order. Revokes S.R. & O. 1946, No. 1300; 1947, No. 1234.
1637	„ 30.	The Barley (Control and Prices) (Northern Ireland) Order. Revokes S.R. & O. 1946, No. 1301; 1947, No. 1234.
1638	„ 30.	The Dredge Corn (Control and Prices) (Great Britain) Order. Revokes S.R. & O. 1945, No. 893; 1946, Nos. 1268, 1741; 1947, No. 1234.
1639	„ 30.	The Dredge Corn (Control and Prices) (Northern Ireland) Order. Revokes S.R. & O. 1945, No. 903; 1946, Nos. 1268, 1741; 1947, No. 1234.
1652	„ 31.	Order amending the Oat Products (Control and Maximum Prices) Order, 1945. Revokes S.R. & O. 1946, No. 587; 1947, No. 536.

No.	*Date.* 1947.	FEEDINGSTUFFS
1626	July 30.	Order amending the Feedingstuffs (Rationing) Order, 1943. Revokes S.R. & O. 1946, No. 2149.
1627	„ 30.	Order amending the Flour Order, 1947.
		FRUIT
1713	Aug. 8.	Order revoking the Home-Grown Apples Order, 1946.
1810	„ 20.	Order amending the Tomatoes Order, 1947.
1826	„ 21.	Order amending the Bananas Order, 1945.
		MILK
1812	Aug. 20.	Milk (Non-Priority Allowance) (No. 3) Order. Revokes S.R. & O. 1947, No. 1304.
		NUT KERNELS
1572	July 23.	The Nut Kernels Order, 1947. Revokes S.R. & O. 1945, No. 757; 1946, No. 1514; 1947, No. 93.
		POINTS RATIONING
1504	July 16.	The Food (Points Rationing) Order, 1947.
1751	Aug. 14.	Order amending the Food (Points Rationing) Order, 1947.
		POTATOES
1573	July 23.	The Potatoes (1947 Crop) (No. 1) Order, 1947. Revokes S.R. & O. 1947, No. 1100.
		PRESERVES
1515	July 18.	The Preserves Order, 1947. Revokes S.R. & O. 1944, No. 841; 1945, Nos. 66, 196; 1946, Nos. 249, 1485, 1694; 1947, Nos. 755, 878.
		RATIONING
1625	July 30.	Order amending the Food Rationing (General Provisions) Order, 1947.
1763	Aug. 15.	Order amending the Sugar and Preserves (Rationing) Order, 1947.
		WELFARE FOODS
1673	July 31.	The Welfare Foods Order, 1947. Revokes S.R. & O. 1946, No. 1148.

The Use of Scientific Instruments in Chemical Analysis

J. H. GLOVER, B.Sc., A.R.I.C.

Part III

Determinations of the exact degree of acidity or alkalinity of a solution are frequently of great importance in chemical processes; such determinations must produce results which can be expressed in simple and precise units, and the term *p*H is used for this purpose. The author describes current methods for its determination.

THE acidity or alkalinity of a solution is dependent on the concentration of hydrogen ions therein, this ranging from about 1 gm. ion per litre down to less than 10^{-14}. Such a wide range renders the use of actual concentrations unsuitable, and for greater convenience the use of the logarithm of the hydrogen ion concentration was introduced by Sorenson. This is called the exponent of the concentration or the *p*H.

Thus when $[H^+]=10^{-7}$ the *p*H is 7 (the negative sign is neglected). Hence *p*H may be defined as a symbol expressing the active concentration of hydrogen ions in a solution on a logarithmic scale.

Main Methods of Determination

The most important methods for the determination of *p*H fall into two groups: colorimetric and potentiometric. The former are of use as rapid but sometimes approximate procedures; they are seldom accurate to less than 0·5 *p*H unit, and may not be applied to darkly coloured solutions. Colorimetric determinations of *p*H involve the use of indicators. An indicator may be defined as a substance which exhibits a colour change, or a series of colour changes, over a definite *p*H range. Such compounds are usually either weak acids or bases and their change in colour may be considered due to dissociation in solution, the resultant ions having a different colour from that of the undissociated indicator. The *p*H range over which the colour change takes place is determined by the dissociation constant of the indicator.

The comparison principle is employed in the determination of *p*H by means of indicators. Indicator is added to the unknown solution and the resulting colour is compared with that produced by the addition of the same amount of indicator to a solution of known *p*H equal in volume to that of the sample. Instruments such as were described in Part I of this series may be employed to facilitate these comparisons, and permanent glass standards are available for several *p*H ranges. Photometers are not used in this connexion, since the variable involved is not colour intensity but colour difference. The solutions of known *p*H are called buffer solutions, their properties and mode of action are described later.

The potentiometric technique being more accurate, and is dependent upon the fact that when a certain type of electrode is immersed in a solution, an electric potential is set up which is dependent upon the *p*H of the solution.

The production of potentials by which *p*H is determined depends upon the fact that any metal, when immersed in a solution containing some of its ions, will, if no chemical action occurs, acquire a potential depending upon the concentration of those ions in the solution. Thus, a piece of copper immersed in a solution of copper sulphate will immediately acquire a potential, the value of which is given by the equation:

$$E = E_o + \frac{RT}{nF} \log_e [Cu]$$

Where E_o is the standard potential for the metal,
R = the gas constant,
F = the Faraday (96,500 coulombs),
n = valency of ions,
T = absolute temperature.

In the same way the potential of a hydrogen electrode would be governed by the H^+ ion concentration or the *p*H of the solution, *i.e.*

$$E_H = E_o + \frac{RT}{nF} \log_e [H^+] \quad \text{or} \quad E_o - \frac{RT}{F} pH$$

It is obviously impossible to use hydrogen as the electrode, but hydrogen adsorbed on to platinum black gives exactly the same effect. In practice, an electrode of platinum is coated with a deposit of the finely divided metal (platinum black) and pure

hydrogen is bubbled around it. This system, known as the hydrogen electrode, obeys the above equation and is used in the potentiometric determination of *p*H.

E_o in this case is the potential acquired by the hydrogen electrode in a solution of *p*H o with hydrogen bubbling at a pressure of one atmosphere, this is taken as the zero of an arbitrary scale of standard potentials, thus reducing the equation to:

$$E = -\frac{RT}{F} pH$$

Hence the *p*H of the solution may be obtained by measuring the potential of the hydrogen electrode. Unfortunately it is not possible to measure the potential of a single electrode, and measurements must be made against a standard electrode of known potential, which is usually termed the reference electrode. The calomel electrode is most frequently used, and consists of mercury in equilibrium with a saturated solution of calomel in potassium chloride solution. The potential is dependent upon the concentration of mercurous ions in solution, and this quantity is in turn dependent upon the potassium chloride concentration. The latter is kept constant, so the potential remains the same if the temperature is unaltered. The potassium chloride solution is usually saturated, although other concentrations are used. Contact with the hydrogen electrode system is made by means of a "salt bridge" of strong potassium chloride solution; this method of connexion minimises the effect known as the "liquid junction potential." Salt bridges take many forms, the simplest being a siphon tube containing the potassium chloride solution, which is prevented from diffusing out by gelling with agar. Tubes with sintered glass ends are also used, but the most convenient type is the one incorporated in the commercial form of calomel electrode, in this case contact being made by a thin film of potassium chloride. This film is contained in a ground glass sleeve fitting over an aperture in the base of the electrode vessel; the latter is dipped in the solution under test. The sleeve is loosened after each determination and a fresh film allowed to form in order to avoid contamination.

The potential acquired by a system consisting of hydrogen and calomel electrodes is given by the equation:

$$E = E_c - E_h$$

Where E_c is the potential of the calomel electrode
E_h is the potential of the hydrogen electrode.

E_c is known, E may be measured and hence E_h calculated. Many forms of apparatus suitable for hydrogen electrodes have been described, and for details of these the appropriate references should be consulted.[1]

The hydrogen electrode is unsuitable for use under certain conditions; for example, the presence of oxidising agents, unsaturated organic compounds, alkaloids, and certain other substances causes large errors.

An alternative method is by the quinhydrone electrode. The principle of this is based on the fact that when a platinum electrode is immersed in a solution containing the oxidised and reduced forms of an oxidation system, a potential is set up dependent on the ratio of the concentrations of these two forms, *i.e.*

$$E = E_o + \frac{RT}{nF} \log. \frac{[\text{Oxidised form}]}{[\text{Reduced form}]}.$$

Quinone and hydroquinone form a suitable system:

$$\text{Hydroquinone} \longrightarrow \text{Quinone} + 2H^+.$$

The potential of the system is then given by the equation:

$$E = E_o + \frac{RT}{2F} \log \frac{[\text{Quinone}]}{[\text{Hydroquinone}]} - \frac{RT}{F} pH$$

Quinone and hydroquinone combine to form quinhydrone, which immediately decomposes to give equal quantities of each; thus if quinhydrone be added to a solution equal quantities of oxidised and reduced forms will be obtained, and the second term of the above equation will be reduced to zero, giving:

$$E = E_o - \frac{RT}{F} pH$$

Thus the potential becomes dependent only upon the *p*H. In practice, quinhydrone is added to the solution under examination, a platinum electrode is immersed therein, and its potential determined against the calomel electrode. The quinhydrone electrode can only be used in acid solutions, and its potential is affected by the presence of ammonium salts.

The Glass Electrode

The most convenient and useful electrode for *p*H measurement is the glass electrode.[2] This was evolved as a result of the discovery that when a solution is in contact with a glass surface a potential difference is set up between the glass and the solution. Several theories have been advanced to explain the source of this potential; one of these postulates a buffer action taking place within the glass, thus maintaining a constant *p*H therein, although there is an exchange of ions between the glass surface and the solution. Thus it may be assumed that there is a constant concentration of hydrogen ions on the glass surface which is the source of the potential.

In practice, the electrode takes the form of a small glass bulb containing a solution of known pH, and when this is immersed in the solution under test the resulting potential is given by the equation:

$$E = \frac{RT}{F}(pH_2 - pH_1) + E_A$$

Where pH_1 is the pH of the solution on one side of the glass surface and pH_2 the pH of the solution on the other; thus if one pH is known and constant the other may be obtained by measurement of the potential. E_A is known as the assymmetry potential; this varies with different electrodes and is due to a variety of factors. The potential produced by the glass electrode bears a linear relation to the pH up to about pH 10, but as above this value a solvent action begins upon the glass the pH relation alters. A special high alkali electrode is now available for use in solutions of pH greater than 10.

The glass electrode should always be kept immersed in distilled water when not in use, and should be standardised against a solution of known pH before a determination is made: this is necessary since the asymmetry potential is liable to alter. Systems incorporating the glass electrode have a high electrical resistance, and efficient screening and earthing are necessary during the measurement of the potential. A recent paper by Lachlan[3] discusses this point and outlines developments in electrode design.

The measurement of potential for the purpose of pH determinations is effected by means of a balancing method, which is necessary since only the minimum amount of current must be taken from the experimental cell; otherwise equilibrium conditions would be upset, the internal resistance of the cell would become a factor, and the measured potential would not represent the pH.

The Poggendorf Principle

The Poggendorf compensation principle may be used; in this method the source of potential is balanced against a standard cell of known and steady potential by means of a potentiometer wire and sliding contact. The Weston cell is almost invariably used as a standard, current is supplied from an accumulator connected across the ends of the potentiometer wire, the Weston cell being connected in opposition to the accumulator by means of a fixed connexion to one end of the potentiometer wire, and a movable contact which can be slid along the wire. The slider is moved along the wire until a galvanometer connected in series with the Weston cell shows no deflection, thus indicating that the balance point has been reached. The length of potentiometer wire necessary for this condition is measured off, and the experimental cell is then substituted for the Weston cell and the balance point again found; then:

$$\frac{E_x}{E_s} = \frac{d_x}{d_s} \quad \text{or} \quad E_x = \frac{E_s \cdot d_x}{d_s}$$

Where E_x is unknown potential,
E_s potential of Weston cell,
d_x and d_s the length of wire necessary for balance.

Potentiometers are commercially available in which the slide wire is replaced by a series of accurately wound resistance coils made to correspond to definite intervals of potential, and a slide wire wound on a revolving drum which is calibrated to give the fractions of the potential intervals represented by the coils.

It must be appreciated that many of the electrode systems in use for pH measurement have an extremely high electrical resistance, and the ordinary Poggendorf method is unsuitable for measurements involving such systems. This method also suffers from the drawback that it is almost impossible to avoid drawing some current from the source of potential to be measured and there is a consequent risk of disturbing the equilibrium of the system.

Thermionic Valves

Methods involving the use of thermionic valves overcome these difficulties to a great extent, and most apparatus employed for pH determinations incorporates a valve in the circuit.

The use of the thermionic valve depends on the fact that if the anode potential and filament temperature are kept constant the anode current depends on the grid potential. Thus any change in the potential applied to the grid of the valve produces an alteration in the anode current. One of the simplest arrangements incorporating the thermionic valve has the system so arranged that a potentiometer coupled in opposition with the unknown cell (as in the Poggendorf method) may be introduced at will into the circuit supplying the grid potential; so that by alteration of a two-way switch the potentiometer system plus the grid battery may be included or alternatively the grid battery alone. With the grid battery alone in circuit the anode current is balanced with a suitable countercurrent to give a suitable galvanometer reading, the switch is then turned to include the potentiometer system in the grid circuit, and the potentiometer is then adjusted to give the same galvanometer reading. At this condition the grid potential must be the same as before, hence the potentiometer system will be contributing no voltage to the grid, and the potentiometer reading will be exactly equal to the potential of the unknown cell.

The potentiometer is previously calibrated against the standard Weston cell. Modern *p*H meters are a modification of this system, the conditions for the operation of the valve being somewhat differently arranged in order to avoid errors due to the high resistance of the glass electrode. These instruments are commercially available and may be obtained either mains or battery operated. They are robust and simple to operate, and precision measurements are easily made.

The applications of *p*H measurements to analysis are numerous and graphs following the change of *p*H during the course of the titrations have been of great importance in determining the most suitable indicator for use. Such *p*H titrations have also been used in deciding the composition of products formed in certain reactions.

The *p*H of milk is of importance, normal fresh milk having a *p*H ranging between 6·5 and 6·6, lower values accompanying souring; but higher values often indicate disease conditions of the udder such as mastitis.

REFERENCES

[1] *Hydrogen Ions.* H. T. S. Britton. Vol. I, p. 40.
[2] *Ibid.* Vol. I, p. 112.
[3] Lachlan, *Analyst*, 1947, **72**, 90.

City Analyst's Report

FIGURES contained in the recently published annual report of the Birmingham City Analyst for 1946 revealed that of the 5,379 samples taken under the Food and Drugs Acts, 345 (or 6·4 per cent.) were adulterated, below standard, or incorrectly labelled.

The percentage of milk samples during the year under review adulterated or not complying with the legal limits was 8·0. This was considerably lower than in the two previous years. The average solids-not-fat figure was higher than it had been since 1936, and the fat content was reasonably good.

Among the food samples examined were baking powders which had deteriorated through being in stock for too long a period; cake flours which failed to comply with current regulations; cordials found to be deficient in sugar and containing excess amounts of saccharin; gravy browning which did not contain on the label the ingredients present; and an onion powder consisting of wheat flour which had neither the taste nor odour of onion, but presumably had originally been impregnated with oil of garlic or onion.

Miscellaneous samples submitted for examination to the Public Health Department included "pop" sold by a young refugee to his schoolmates which was found to consist of nothing but dirty water, probably from a stream or pond.

New Fish Handling Methods

ONE of the most thorough tests ever undertaken in the handling of fish, the shipment of 90,000 lb. of salmon and halibut from Prince Rupert, B.C., to Montreal—3,116 miles—has just been successfully completed, according to a joint announcement made by the Canadian Pacific and Canadian National Railways.

New methods of handling fish, resulting from the tests which have been conducted in the past two months, will open up new markets for Canadian fish which were hitherto too distant and will also better maintain its original quality. The experiments were carried out with the co-operation of the railways, Canadian Food Preservation Committee, National Research Council and Fisheries Experimental Board, and perishable food shipment engineers and experts.

One carload of the frozen fish was loaded at Prince Rupert at 12·7° F., which, by a new treatment consisting of the addition of ammonium nitrate to the regular ice and salt mixture, was cooled in the car *en route* and arrived in Montreal seven days later at 10·6° F. Two other cars without the chemical were loaded at 16° F. and arrived without change of temperature.

A special observation car was attached to the experimental train in which a laboratory was set up for the research engineers to permit them continuously to observe the shipments. Seventy-two thermometers and thermocouples were placed inside the overhead-iced refrigerator cars and were wired to recording instruments in the laboratory. While the tests have proved successful, the complete results of the extensive studies, which were concluded only very recently, will not be assembled and co-ordinated for some time. These will be made known following the annual meeting of the Canadian Food Preservation Committee next January at which the various engineers who conducted the tests will attend.

Included among the engineers who conducted the experiments were O. C. Young, chief research engineer, and David Taylor, research engineer, Pacific Fisheries Experiment Station, Vancouver; J. Carbert, refrigeration engineer, E. Rock, research engineer, National Research Council, Ottawa; J. L. Townshend, general supervisor of perishable traffic; Norman Walton, research engineer, Montreal; and D. C. McVeigh, supervisor of perishable traffic, Winnipeg, of the Canadian National Railways; and F. Morrison, supervisor, perishable traffic, Winnipeg, and J. Griffiths, inspector of perishable traffic, Vancouver, of the Canadian Pacific Railway. The tests were observed by Rao Sahib V. John, deputy director of fisheries for the Indian Government of Madras, India.

Stalks of asparagus in the field, after having been cut by hand.

Canning of Asparagus in California

W. V. CRUESS

Food Technology Division, University of California

For many years California has led other States of the U.S.A. in the canning of asparagus. At one time practically all of the pack was in the form of white spears. In recent years, however, the canning of all-green spears and of cuts-and-tips has greatly increased in proportion to the white spears. Also, since green asparagus can be grown commercially in many other States, the canning of green spears has increased materially in certain of these areas. Since land values and cost of production are higher in California, it is not unlikely that canning of asparagus in these other States will increase at the expense of the Californian industry. On the other hand, owing to the peculiar soil, water and climatic requirements for production of white asparagus it is likely that California will retain its present leadership in the canning of that product.

ACCORDING to a recent report of the U.S. Department of Agriculture California has approximately 49,000 acres of asparagus in production and the average quantity available for canning and freezing is about 53,000 tons. The packs of canned asparagus in terms of cases of 24 quarts each have been for a few selected years as shown in Table 1.

Cultivation

Most of the asparagus for canning and freezing is grown in the peat soils of the delta of the Sacramento and San Joaquin rivers about seventy-five miles east and north-east of San Francisco. These soils are rich in decomposed organic matter and will, in fact, burn. When cultivated they are fluffy and friable, thus of ideal physical condition for

A V-shaped knife on the end of a handle about 15 in. long is used for cutting.

growth of plump, straight spears of asparagus. Since most of the fields are below the water level of the two rivers and their meandering multiple outlets of the delta the beds may be irrigated very easily by syphoning of water from the rivers or by pumping from shallow wells, much as is done in Egypt in the Nile Valley. Drainage is necessary in some cases, with pumping of the drainage water into canals or the river. Irrigation is usually by sub-irrigation from narrow ditches rather than by flooding.

TABLE 1

PACKS OF CANNED ASPARAGUS IN CALIFORNIA FOR SEVERAL SELECTED YEARS

(*After Canners' League Statistics*)

Year.	*Cases of Asparagus.*
1905	228,000
1925-30 average	2,300,000
1940	2,181,000
1945	2,479,000

Plants are grown in nurseries from seed and the root stocks transplanted when they attain suitable size. A fair crop of spears is obtained two years after planting and the beds bear commercially until sixteen to twenty years of age. For some reason not yet definitely determined, land on which asparagus has been grown for sixteen to twenty years will not grow a new planting satisfactorily. Whether necessary trace elements are removed from the soil by previous crops, or the soil rendered toxic by continued cropping, or whether some other

The spears are gathered into a small four-wheeled wagon for transport to the field shed.

factor is concerned, is still a problem for further study. This situation makes it necessary to plant asparagus in new fields when the old plantings are ploughed up and discontinued. Unfortunately, the acreage suitable for growing white asparagus is not unlimited.

Harvesting

The cutting of asparagus usually begins early in March, but since the demand for the fresh market is very keen and prices high early in the season the canners usually wait until about mid-April before packing asparagus heavily.

Certain fields are set aside for green asparagus. In this case the surface of the field is flat, not ridged. The stalks are allowed to attain a height of about 10 to 12 inches and are cut by hand at the surface of the ground with a short, flat, V-shaped knife on the end of a handle about 15 inches long. Cutting is usually done by contract labour, often by Filipino workmen, at an agreed-upon rate per pound.

White asparagus is grown under ridges of soft soil about 12 to 15 inches high. It is cut beneath the soil by workmen who walk along the rows and locate the stalks by a slight bulge in the surface of the soil or by emerging tips of spears. It is customary to go over each field daily.

To prevent staining and retard chemical changes, the boxes of asparagus are immersed in a tank of cold water.

Handling of Stalks

The stalks are laid in neat piles of a dozen or two spears each. These are gathered into a small four-wheeled wagon drawn by a horse. The spears are taken to the field house where they are washed and cut to about 8 inches in length, either by hand or more frequently the spears are placed on a chain conveyor and cut to length by a rapidly revolving circular knife. They are then placed in 50 lb. lug boxes and transported by truck or by speed-boat to the cannery. As the canneries are located on the river or a canal water transportation is often feasible and convenient.

Asparagus after cutting must be canned promptly, usually on the day it is cut. If allowed to stand too long it becomes bitter, loses most of its sugar, and becomes fibrous and tough. Also it should be kept wet and cool to prevent staining and retard chemical changes. For this reason it is moistened at the field house and again in some manner on arrival at the cannery, an effective method being to immerse the boxes of asparagus into a tank of cold water. Another method is by spraying the boxes with water.

In warm weather some plants cover the cut asparagus with crushed ice until it is canned.

Inspection and Cutting

Composite representative samples of each delivery are carefully inspected and graded by inspectors in the employ of the cannery. In New York State the inspection and grading are done by trained personnel in the employ of the State Department of Agriculture. In either case the grower is paid according to quality of the delivery. Size of spears, colour, freedom from blemishes, freedom from mud or adhering soil, degree of "flowering," straightness of spears, and other factors are taken into account.

In most canneries the asparagus first passes through heavy sprays of water to soften and remove adhering soil. Also, after cutting, the spears are again washed very vigorously under high-pressure sprays of cold water.

The spears are blanched on a moving woven-mesh metal conveyor in live steam.

At one time the stalks were placed in small boxes and cut by hand by a long butcher knife, or by rapidly revolving circular knife, to length suitable for canning. The butts were for the most part discarded.

At present it is customary to place the stalks in proper position by hand on a travelling chain conveyor which carries them beneath two rapidly revolving circular knives. The first removes the waste ends of the butt, the second cuts off a short segment from each stalk. The second cuts are sorted and combined with short tips for canning as centre cuts and tips; that is, some of the centre cuts are so utilised, some are discarded with the waste butts, and some are canned as soup cuts.

Size Grading

In some canneries the spears are given a preliminary grading for size in roller or diverging rubber cable graders. Owing to irregularities in shape of the spears this grading is not 100 per cent. effective, and additional size grading by hand is required; nevertheless, it reduces size grading cost. Formerly, all of the fresh asparagus was carefully sorted into various size grades and colours by hand. At present size grading is usually done by the canning crew from a slowly moving, broad rubber belt after blanching; that is, grading is done as the spears are being placed in the cans.

Blanching

Formerly the asparagus after size grading, quality sorting and washing was placed in large, wicker, two-handled baskets and immersed for the required period in tanks of hot water at or near the boiling point, either by placing the baskets in the tanks and removing them by hand or by conveying them mechanically through the hot water and then through a tank of cold water.

At present in most canneries the spears are blanched on a moving woven-mesh metal conveyor in live steam and are cooled in sprays of cold water and by fluming. The steam blanching is for 2 to 4 minutes; average about 2½ minutes.

In some cases, as in the Bercut-Richards cannery in Sacramento, California, the spears are blanched in hot water in a flume—a shallow, narrow metal trough through which water is flowing.

In most California canneries, as well as in the famous Seabrook Cannery near Deerfield, New Jersey, the blanched asparagus is conveyed and cooled by fluming in cold water to the canning belt. At the belt the asparagus is continuously screened from the water and the water discarded.

Canning

In some cases the spears, tips, and centre cuts are canned from a slowly moving, broad rubber or stainless steel belt. Sorting for colour, size, and quality is done by the canners. The largest and best spears are removed first and the poorest quality and smallest last. Culls pass over the end of the belt and are discarded. Some canners pack from sinks.

Formerly practically all California asparagus was packed in cans of square cross section of about one quart and one pint capacities. At present the trend is strongly in favour of cylindrical cans and the square cans are going out of style.

The spears are packed very carefully to avoid damaging the buds. Previous blanching wilts the spears and toughens them so that they may be packed more readily.

Brining and Salting

Formerly the cans were filled by automatic briner with a dilute brine of about 2¼ per cent. salt before exhausting. The present trend, however, is toward adding salt by automatic salt dispenser in the can-conveying line which drops a measured amount of dry granular salt or drops a pellet of proper size into each can. The salt is added after exhausting. That is, the can is filled with water, passed through the exhaust box, and the granular salt or salt pellet is added immediately before sealing.

Exhausting

In some canneries cans of green asparagus are not exhausted but are filled with boiling hot brine, or with boiling water followed by addition of salt or salt pellet, and the cans sealed at once without exhausting, in the belief that the delicate buds are less apt to be damaged by this procedure. In some canneries steam exhaust is omitted because the cans are sealed in vacuum. Where exhausting is practised it is usually for about five minutes in live steam in the conventional continuous cannery exhaust box.

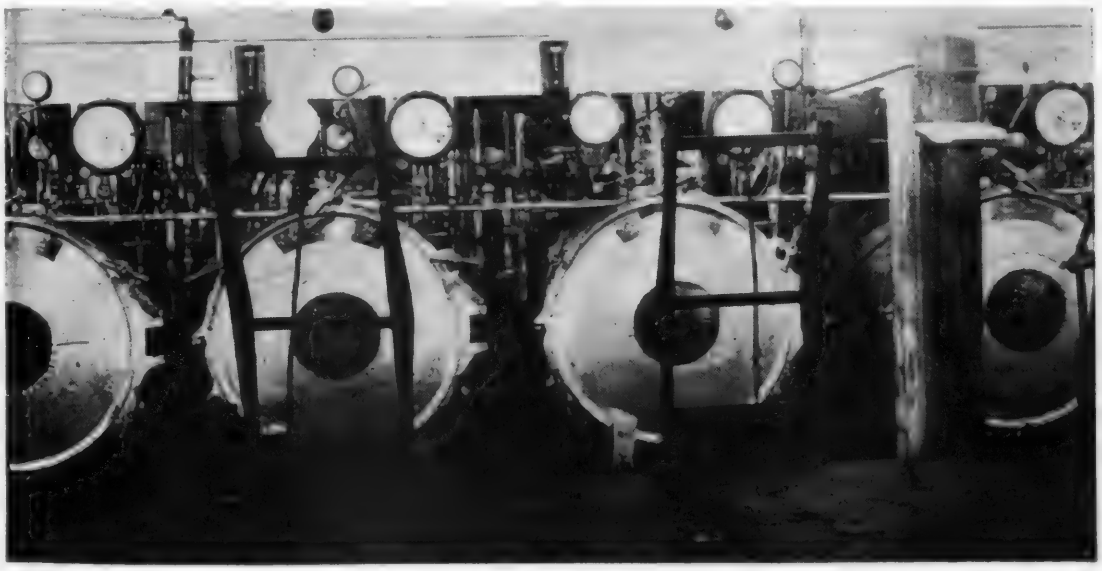
Bercut-Richards Company of Sacramento does not use the steam exhaust, but instead pre-vacuumises each can in a vacuum chamber and seals it (double-seams) under vacuum. This method avoids possible damage of the steam exhaust box, shortens the canning line by elimination of the exhaust box, and greatly reduces the amount of waste steam in the cook room atmosphere.

The double seaming of square cans requires special double seamers. Formerly these were four to five stage machines requiring much floor space, but at present they are two stage in operation and similar in outward appearance to double seamers for cylindrical cans.

Like all non-acid canned foods in California the final processing (sterilising) of canned asparagus is under State Board of Health inspection and according to times and temperatures set up by that agency. These "cooks" (process times) are based on the research of the National Canners' Association research laboratories, particularly that under Dr. J. R. Esty in San Francisco, California. The present official times and temperatures in tin cans in non-agitating retorts are given in Tables 2 and 3. Each retort must be equipped with a temperature recorder and an automatic record kept of each lot that is sterilised. The cans of each lot must be coded with an identifying number in order that it may be segregated if the retorting is for any reason unsatisfactory to the State inspector.

The cans must be upright in the retort in order that the spears do not impede convection currents during heating.

The cans are cooled in the retorts by sprays of water. Air pressure is applied to No. 10 cans during the initial stage of cooling in order to prevent buckling when the atmospheric pressure in the closed can suddenly drops after turning off the steam.



Battery of retorts, equipped with automatic temperature recorders.

TABLE 2

PROCESSING TIMES AND TEMPERATURES FOR CANNED WHITE ASPARAGUS

Size of Can.	*Process Temperature in ° F.*	*Process Time in Minutes.*
No. 1, No. 2, No. 1 square, and No. 2½ square	240	24
No. 10	240	35
No. 1 to No. 2½	248	12
No. 10	248	15

TABLE 3

PROCESSING TIMES AND TEMPERATURES FOR CANNED GREEN ASPARAGUS

Size of Can.	*Process Temperature in ° F.*	*Process Time in Minutes.*
No. 1 to No. 2½	240	26
No. 10	240	35
No. 1 to No. 2½	248	13
No. 10	248	15

Thermophilic spoilage, usually gaseous, by soil-borne thermophilic anaerobic bacteria occurs occasionally, but less frequently than formerly. The National Canners' Association research staff has found that certain fields are so heavily contaminated with these anaerobes that it is recommended that asparagus grown in them should not be canned.

On standing after the opening of the can, green asparagus sometimes shows blackening; a reaction between oxidised iron and tannin. Addition of a small amount of citric acid or cutting the asparagus less immature reduces this tendency. Also occasionally waxy crystals of a harmless yellow flavon appear on long storage of canned asparagus. It dissolves on heating.

The butts cut from the stalks at the field house and in the cannery amount to 50 per cent. or more of the weight of the asparagus as cut in the field. Practically all of these waste butts are discarded, or at best may be spread in the fields and cultivated into the soil. Usually they are dumped into the river finally to settle and decompose. However, the California Fish and Game Commission has ruled that this practice must cease, and it is probable that some use will be found for the butts.

The College of Agriculture has found that after drying they have considerable feeding value for livestock. They may be dried on a smooth rolled ground surface in the sun at small expense. The raw butts have about 95 per cent. moisture; hence dry-away is very heavy.

It has been found that the juice expressed from steam blanched butts is an excellent bacterial culture medium for the production of antibiotics such as gramicidin and others.

Cereal Chemistry

THE subject of cereal chemistry has developed to such an extent that it has warranted the production, from time to time, of books dealing with special aspects of the subject. One book covering the whole subject, however, is highly desirable in order that a complete picture of the basic principles and their application in the various specialised trades and industries may be presented.

It was a particular pleasure to the reviewer to note the appearance of a fourth edition of Dr. Kent-Jones' book* on cereal chemistry. This book has a well-deserved and established reputation and has, unfortunately, been out of print for some years. The new edition is greatly enlarged in scope and detail. For its production Dr. Kent-Jones has had the assistance, as co-author, of Dr. Amos, while the author's foreword renders thanks to a number of workers for their collaboration in the specialised sections. The galaxy of names in this foreword is eloquent testimony that every section of the subject is authoritatively covered.

The war period was an extremely difficult one for authors attempting such comprehensive works, for, like other good citizens, besides their normal daytime duties most of their spare time was taken up with work directed towards national safety for which their training had particularly fitted them. The frequency of air raids scarcely promoted that peace of mind and serenity of soul deemed most conducive to good work. One of the most severe obstacles was, however, the spasmodic appearance, or non-arrival for considerable periods of time, of foreign publications so essential to obtaining a balanced picture of work carried out on any subject. Nor with the end of hostilities did the authors' difficulties cease, for publication of finished MSS. was, and still is, beset by difficulties caused by shortage of labour and material. In spite of all these drawbacks Drs. Kent-Jones and Amos have produced a most excellent, authoritative, and complete account of cereal chemistry, for which workers in this field will be grateful. Those who know the earlier editions will find the fourth edition follows the same general form and lay-out, which experience has proved widely acceptable. Much judicious pruning has been carried out on the older work and a great deal of new material has been included. A new chapter on the assay of vitamin content of cereals and cereal products has been introduced, and the three new chapters included for the first time in the ill-fated third edition, which was largely lost in the Liverpool blitz, have been extended to modernise them.

* *Modern Cereal Chemistry*. By D. W. Kent-Jones, Ph.D., B.Sc., F.R.I.C., and A. J. Amos, Ph.D., B.Sc., F.R.I.C. Pp. 651+vii. 50s. net.

A brief but well written review of the fundamental concepts of colloidal chemistry, *p*H, and oxidation and reduction potentials replaces the chapters previously devoted to colloid chemistry and the meaning and significance of hydrogen ion concentration in former editions.

The book comprises the following chapters: Composition of Wheat and Products of Milling; Principal Wheats of the World; Barley; Rye; Oats; Maize; Rice; Soya and Potato; Some Physico-Chemical aspects of Flour; Flour Strength; Conditioning and the Effect of Heat on Wheat and Flour; Composition of Milled Products; The Technique and the Chemistry of the Baking Process; Bleaching of Flour Improvers; Dough Testing Apparatus; Use of Wheat and Flour for Special Purposes; Nutritive Value of Cereals; Cereals and Balanced Rations for Livestock; The Microbiology of Cereals; Moisture in Cereals and Cereal Products; General Analytical Procedure for Cereals; Assay of Vitamin Content of Cereals and Cereal Products; Appendix; Bibliography; Subject Index; Author Index.

In this edition more attention has been given to cereals other than wheat, and this will be found a very useful extension. In general matters and in those specialised sections to which the reviewer's competence extends the work is as up-to-date and as well presented as anything yet published in this field. In other specialised sections the reputation of the authors and their collaborators amounts almost to a guarantee of excellence and authority. Only one point of criticism appears worthy of mention, and that is directed at the Appendix. After an excellent and sustained dissertation on a complicated and widespread subject it is with something of a jolt to find the authors think it necessary to include a table of atomic weights, of conversion of degrees Fahrenheit to degrees Centigrade, and equivalent weights and measures usually found at the back of the schoolboy's "lab." book or the data-diary of the average chemist. The rest of the Appendix contains tables of value to those in industry, but the three pages mentioned might well be left out in future editions. Apart from this trivial point there is little to criticise.

No one interested in milling, baking, brewing, confectionery, cereal foods for animals or humans, or in any branch of cereal chemistry should fail to have a copy of this unique book at hand.—J. A. R.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Food Poisoning

DURING the past summer, the matter of food poisoning of bacterial origin has received much unwonted publicity. That attention should be focused on the dangers of unwholesome food is unquestionable, but it is to be feared that the type of publicity accorded some recent outbreaks can but serve to increase the prejudice and misunderstanding which already surround the subject. In some cases, the remarks of competent authorities have been taken from their context and given headline prominence; in others, publicity has been given to statements emanating from not so competent sources. These practices give rise to unnecessary apprehension, and usually reflect unfairly on a particular type of product such as canned food or ice cream. It is all too rarely appreciated that the majority of outbreaks occur because some fundamental of food hygiene has been ignored or misapplied and that the type of food concerned is of secondary importance.

The second edition of a book* dealing with the nature, history, causation, and control of food poisoning, as Dr. Gerald Leighton states in his foreword, should help to dispel some of the erroneous ideas still prevailing.

The book comprises three sections. Part I includes an historical survey of early theories and investigations into food poisoning. The remainder of this section is given over principally to discussion of Salmonella poisoning, sources and modes of infection, prevention and control, etc. Part II deals with Staphylococcal food poisoning, contamination of foods by poisonous metals, poisonous plants, edible and poisonous fungi, poisonous fish, and food allergy. The third section is devoted entirely to Botulism. Two appendices are included, and these cover the laboratory investigation of food-poisoning cases and the procedure to be adopted by Medical Officers of Health in suspected cases of food poisoning.

As the author remarks, the literature dealing with food poisoning, especially that of bacterial origin, is voluminous and widely dispersed, and selection of material for a book of this kind is a difficult task. Making due allowance for this, however, it is felt that one or two aspects of the subject could have been presented in better perspective, as, for example, the ability of the Salmonella group to give rise to toxin-type poisoning. Although reference is made to the fact that the toxin hypothesis has been the subject of much controversy, Mr. Dewberry's stand in the matter is not very clear. Much of the work relating to the production of heat-stable Salmonella "toxins" was carried out

* *Food Poisoning*. By Elliot B. Dewberry, F.R.San.I., M.R.I.P.H. 2nd Edition. Pp. 246. London. 17s. 6d.

many years ago, and the validity of the methods used to demonstrate the "toxin" has been questioned by many. Most authorities now agree that the role of the Salmonella group in food poisoning is that of an infection.

In some quarters, and this does not exclude all those professionally concerned with public health, there still exists an unjustifiable prejudice concerning canned foods and their relation to food poisoning. Mr. Dewberry rightly points out that canned foods are less liable than other foods to give rise to illness, but some elaboration of the reasons why this is so would have been an advantage. Modern standards of heat-processing are such as to render canned foods "safe." They are no safeguard against post-process infection via damaged or defective seams, or contamination and intoxication of canned foods carelessly handled or stored after opening. Such causes as these probably explain many of the cases in which canned products have been incriminated on the score of "heat-stable toxins."

The chapter on Staphylococcal food poisoning is comprehensive and up to date. The contamination of foods by poisonous metals is also adequately covered, although the author is in error in stating that the tin coating is removed in canned foods during the first two months of storage (page 100). The sections devoted to the poisonous plants, fungi, and fish are particularly valuable, since they contain information not readily available elsewhere. Food allergy is dealt with briefly but in a manner sufficiently informative to show that illness following the consumption of a meal cannot always be attributed to unsoundness of the food.

The author presents a very extensive survey of the subject of Botulism. The history of this disease and the accounts of early investigations are full of interest. The bacteriology, symptomatology, and other aspects of Botulism are adequately covered, but it is felt that the author might have included some reference to Scott and Stewart's findings in relation to the inhibition of growth of *Cl. botulinum* by dissolved tin in canned foods and to the review of Slocum *et al.* on the subject of Botulism outbreaks caused by acid foods. A useful feature in this and other sections of the work is the inclusion of illustrative outbreaks.

The author does not seem to have been too well served in the matter of proof checking. The book contains some errors and inaccuracies such as "fractional distillation" for fractional sterilisation (page 210) and the statement on page 187 that type "A" (*Cl. botulinum*) differs from type "B" in that "it can resist comparatively low temperatures." On the same page the table stated to appear on page 134 is to be found on page 188. Apart from these obvious slips the book presents a useful summary of most of the aspects of food poisoning, and the popularity won by the first edition should be maintained by this revised version. The book is well produced and very reasonably priced.—J. G. B.

Thermophilic Bacterial Spoilage in Canned Goods

How scientific methods saved the U.S. Army millions of dollars by averting spoilage of canned vegetables was related by Dr. Hatton B. Rogers at the seventh national conference of the Institute of Food Technologists, U.S.A.

To establish the suitability of canning material for tropical zones, the Army instituted a system of mobile laboratory units which travelled about the canning areas making surveys of the products. The initial unit was able to detect thermophilic bacteria in canning plants, and to determine the spots in the process where they entered the product, thus making it possible to advise canners how to eliminate them.

Dr. Rogers estimated that by protecting the Army against purchases of canned foods unsuitable for shipment overseas because of thermophilic bacteria contamination, the first mobile laboratory saved $4,350,000. During the summer of 1945, two other mobile units were in operation, and the three conducted tests on $28,000,000 worth of canned goods.

It had also been reported that it was now possible to use large stocks of sugar for canning which had been regarded as unusable for this purpose because of contamination by thermophilic bacteria. A processing machine was developed in which the contaminated sugar, spread in a thin layer, was exposed to a battery of ultra-violet lamps that effectively killed the bacterial spores. One of these units had made it possible for canneries to use 200,000 lb. of sugar which would otherwise have been unusable.

As one result of the survey, 2,900,000 dozen cans of peas and 2,200,000 dozen cans of corn were found not acceptable; 3,600,000 dozen cans of peas and 2,820,000 cans of corn were diverted to temperate climates to avert the possibility of thermophilic bacterial spoilage.

BOOKS RECEIVED

Foods: Their Values and Management. By Henry C. Sherman. U.S.A. and London. Pp. 221. Price 18s.

Food Consumption Levels in United Kingdom. Cmd. 7203. H.M.S.O. Price 6d.

The Control of the Concentration of Nitrite in Bacon Curing Brines

M. INGRAM, J. R. HAWTHORNE and D. P. GATHERUM

Low Temperature Research Station, Cambridge.

Part I

Investigations were made by the authors to find practical means of controlling the nitrite content of the brines used in the tank-curing of Wiltshire bacon. Methods and laboratory experiments are described.

THE following cycle of operations usually takes place in the use of the brine. Sides of pork, injected with brine, are sprinkled with salt and saltpetre, stacked in piles in the pickling tank, and battened down. The brine is then run in from the bottom of the tank, and thereafter during pickling the tank is not disturbed for several days. During this period, water, protein, etc., are withdrawn from the meat, and substances from the brine are absorbed by the meat. At the end of the period the sides have to be removed from the top of the tank, and as they occupy much of the space in it, extra brine has to be pumped in as they float up; this is mixed with the brine originally present, by the disturbance occasioned by the removal of the sides. The mixed brine is then pumped off from the bottom of the pickling tank into a storage tank. Salt and saltpetre may be added at this stage, and the brine then rests until it is needed again. In this way the brine may be used many times over. The storage tank is usually large enough to hold in reserve a bulk of brine from the several pickling tanks. By varying the amounts of salt and saltpetre sprinkled on the sides, or added to the brine in the storage tank, the composition of the brine can be controlled. All these operations are usually carried out at about 5° C. (40° F.).

As a result of these operations nitrite appears in the brine and is absorbed by the meat, where it forms the nitrosohaemoglobin which gives cured meat its characteristic red colour.

In peace-time, with an even supply of animals of uniform quality, some factories were able to operate their brines in such a way that the concentration of nitrite did not change substantially over a period of years. The fact is rather striking, for the concentration of nitrite was not measured; the composition of the brine being regulated by observation (sometimes not very accurate) of its specific gravity, by means of a hydrometer floating in it.

This degree of control was much to be desired, for if the concentration of nitrite became too low it was illegal in Britain before the war to add nitrite to make up the deficit,* while if it became too high, the brine had to be diluted with a solution of salt and saltpetre and the excess thrown away.

As a result of the irregularities associated with war conditions, many factories experienced large fluctuations in the nitrite in their brines, so that its control became a matter of importance.

Analytical Methods

Before going on to describe the investigations, a brief account is given here of the methods employed.

Samples of brine were sent from the factory to the laboratory for analysis. This was done in one of two ways: (i) in cases where the sample could be transmitted within three hours, brine was filled into a screw-capped bottle which was packed in wood-wool at curing-room temperature (5° C.); (ii) for longer journeys, thermos flasks were filled to within an inch of the top with the brine (if filled completely the flasks are liable to break) and then packed in wood-wool for despatch. By these methods it was possible to prevent the temperature of the brine attaining 10° C. before delivery at the laboratory. (This procedure has been found more satisfactory than the use of antiseptics [Ingram, 1937].) On the occasions when the brine could not be examined at once, it was filled into conical flasks with the necks sealed with liquid paraffin and stored at −10° C.

Salt was estimated as chloride, at first by the Volhard method and later by electrometric titration (Ingram and Hawthorne, 1945); figures are throughout expressed as percentage of sodium chloride (g/100 ml.). Nitrite was estimated by the

* This prohibition was removed by Ministry of Health Provisional Regulation (Circular 1892), October 25, 1939.

method of Auerbach and Reiss (1919) after the protein had been removed with colloidal iron, or (towards the later stages of the investigation) with the polarograph (Ingram, 1941); concentrations of nitrite are expressed in parts per million calculated as potassium nitrite.

The actual arrangements of the various experiments are described separately in the appropriate places below.

Laboratory Experiments on the Role of Salt

Laboratory examination of pickling brines sent from various factories showed that it was apparently usual for the concentration of nitrite to increase during storage. Examples are given in Table 1.

TABLE 1.

THE INCREASE IN CONCENTRATION OF NITRITE IN BRINES FROM PICKLING TANKS, WHEN STORED AT 5° C.

Example.	*A.*	*B.*	
		(i)	(ii)
Days storage	14	3	10
Specific gravity	1·169	1·177	1·177
Salt. Per cent.	22·7	25·1	25·1
Initial nitrite (p.p.m.) ..	44	640	640
Final nitrite	219	890	1010

These samples were withdrawn without special precaution as a matter of factory routine from the surface layers of the pickling tanks.

It was also found that when sides of pork are being cured, the concentration of nitrite in such brines rises. This was repeatedly observed during examination of consecutive samples of brine taken from the surface layers during the period of one pickling operation.

TABLE 2.

THE INCREASE OF CONCENTRATION OF NITRITE IN THE SURFACE LAYERS OF PICKLING BRINES DURING THE PICKLING PROCESS.

Examples.	*A.*	*B.*	*C.*	*D.*	*E.*	*F.*
Temperature (° C.) ..	5·0	5·0	5·0	5·0	5·0	3·5
Duration of pickling (days) ..	5	3	3	3	4	4
Initial nitrite (p.p.m.) ..	10	7	10	37	250	518
Final nitrite (p.p.m.) ..	53	71	69	72	270	1210

These observations, apparently showing that the concentration of nitrite tended to rise both in the presence and absence of sides, seemed to indicate that it might rise without limit; and it was therefore clear that in a well-regulated brine there must, at some stage in the cycle of operations, be a compensatory fall.

It was noted that as a rule the concentration of nitrite in the pickling tanks appeared to be higher than that in the storage tanks; and that it was in the transfer of the brine from the pickling tank to the storage tank that the fall in concentration occurred, which balanced the increase in the other processes.

TABLE 3.

THE APPARENT CONCENTRATIONS OF NITRITE (P.P.M.) IN PICKLING TANKS AND STORAGE TANKS, MEASURED AT THE SAME TIME.

Examples.	*A.*	*B.*
Curing tank	40	53
Storage tank	4	8

It had previously been shown that the concentration of nitrite in a pickling brine is greatest at the surface (Callow, 1934a), and it seemed that this might be the chief reason for the apparent fall when this brine was mixed with that from the storage tank. The correctness of this view was verified by mixing used pickling brine by pumping it quietly and without splashing into an empty tank, when the apparent concentration of nitrite, as measured on surface samples, was considerably decreased (Table 4).

TABLE 4.

THE APPARENT FALL IN CONCENTRATION OF NITRITE (P.P.M.) FOLLOWING MERE MIXING OF THE BRINE IN PICKLING TANKS.

Examples.	*A.*	*B.*	*C.*	*D.*	*E.*	*F.*
Surface layer of curing tank at end of cure ..	67	69	150	190	327	348
Mixed sample immediately after mixing	25	19	86	50	222	230

Investigation of several brines during the pickling operation confirmed the earlier report (*op. cit.*) that the concentration of nitrite decreases downwards, and it proved that the concentration of salt in the brine varied in the converse sense, *i.e.* it increased downwards. A simple reason may be suggested. As the curing tank is not disturbed after the brine has been run in, the more concentrated brine formed by solution of the solid salts sprinkled on the sides collects at the bottom of the tank (this can be seen to take place if a wire tray containing salt is suspended in curing brine contained in a glass vessel); and conversely, it appears that a less concentrated solution (formed by dilution of the brine by water, etc., extracted from the meat) collects at the surface. Examples to illustrate these points are given in Table 5. The considerable differences in the composition of the brine at various levels lead to the theory that sides at the top of a tank might be cured very differently from sides lower down.

Whenever this layering occurred, it was found that there was a striking inverse correlation between the concentrations of nitrite and of salt at any given depth in the pickling tank. In some of these tanks (*e.g.* example A), the concentration of salt was relatively uniform, and the concentration of nitrite did not vary greatly with depth. In

TABLE 5.

LAYERING OF BRINE IN UNDISTURBED PICKLING TANKS AT THE END OF THE PICKLING PERIOD.

Example.	*A.*		*B.*		*C.*		*D.*		*E.*		*F.*	
Duration of Pickling (days).	3.		3.		2.		3.		3.		3.	
	Per Cent. Salt.	*Nitrite P.p.m.*	*Per Cent. Salt.*	*Nitrite P.p.m.*	*Per Cent. Salt.*	*Nitrite P.p.m.*	*Per Cent. Salt.*	*Nitrite P.p.m.*	*Per Cent. Salt.*	*Nitrite P.p.m.*	*Per Cent. Salt.*	*Nitrite P.p.m.*
Before use	21·8	170	21·1	196	25·9	5	21·3	196	21·6	187	20·7	150
After use:												
Surface	20·5	348	20·1	327	25·0	41	20·8	1,600	20·4	227	20·4	250
1′ 8″ down	—	—	20·4	321	—	—	20·8	409	20·2	216	20·8	230
2′ down	20·9	181	—	—	25·4	34	—	—	—	—	—	—
3′ 4″ down	—	—	21·2	203	25·9	4	21·0	123	21·0	168	—	—
4′ down	22·7	145	—	—	—	—	—	—	—	—	—	—
4′ 4″ down	—	—	28·7	148	—	—	26·8	35	24·4	136	29·5	150
5′ down					23·1	3						
Calculated average ..	21·4	208	21·6	270	—	—	21·6	505	21·2	195	—	—
Samples after mixing merely by pumping away	21·2	230	20·8	222	—	—	20·8	230	21·0	180	—	—

A-C.—Normal pigs and salting.
D.—Salt on bottom layers only.
E-F.—Frozen pigs, extra salt.

Samples from the depths of the tanks were secured by means of a long vertical tube about 5 mm. bore, connected by rubber tubing to a collecting flask, into which the brine was caused to run by evacuation. The first runnings were rejected, to wash the tube.

others, the concentrated salt solution formed only a shallow layer at the bottom of the tank (examples B and C), and in them the concentration of nitrite fell sharply in the bottom layers. An attempt was made to accentuate this effect (example D) by salting only the bottom layers of sides in the tank.

It will be seen that, considering the small number of observations made in the heterogeneous system in the pickling tanks, there is quite satisfactory agreement between the average values calculated for the whole tank from these observations and the average values actually observed when the contents of the tank were mixed by pumping off. The exception was the tank D in which salt was placed only on the bottom layers of sides and the nitrite concentration at the surface rose to an inordinately high level. Thus it appears that in normal circumstances, any changes in the concentration of nitrite as observed at the surface can satisfactorily be accounted for by the layering which may develop in the tank during pickling.

Influence of Salt

It will be observed from the examples quoted in Table 5 that as a consequence of the pickling operation the overall concentrations, both of salt and of nitrite, sometimes fell and sometimes rose. In neither case, however, was this change at all substantial; and it is to be noted that this was the result of a balance between the changes at the top and bottom of the tanks. At the surface the brine was diluted and nitrite was produced; but in the concentrated salt solutions towards the bottom, nitrite actually disappeared.

These facts suggested that the greatest production of nitrite at the surface of the tank was due to the fact that the concentration of salt was lowest there. This agreed with the observation that, even in the surface layer of a brine during a single period of use in the pickling tank, the nitrite concentration rose as the salt concentration fell, as is shown below in Table 6.

TABLE 6.

THE INVERSE RELATION BETWEEN SALT-CONTENT AND CONCENTRATIONS OF NITRITE IN THE SURFACE LAYER OF PICKLING TANKS DURING THE PROGRESS OF PICKLING.

Examples.	*A.*		*B.*		*C.*	
	Per Cent. Salt.	*P.p.m. Nitrite.*	*Per Cent. Salt.*	*P.p.m. Nitrite.*	*Per Cent. Salt.*	*P.p.m. Nitrite.*
Covering brine	25·9	2	25·9	10	25·3	10
Surface:						
after 1 day curing ..	—	—	25·1	27	25·1	31
after 2 day curing ..	24·4	20	24·4	38	24·8	45
after 3 day curing ..	24·0	25	24·0	47	24·2	59
after 4 day curing ..	23·7	30	23·9	41	23·7	53
after 5 day curing ..	—	—	23·3	53	23·5	69

To elucidate this relation further, a laboratory experiment was carried out, in which a brine ready for use was poured into a vertical tube of depth equal to that of a pickling tank (5 feet) and the whole was stored undisturbed for fourteen days. Even at the end of this period there was no significant variation in the concentration of nitrite or of salt throughout the whole depth of the tube.

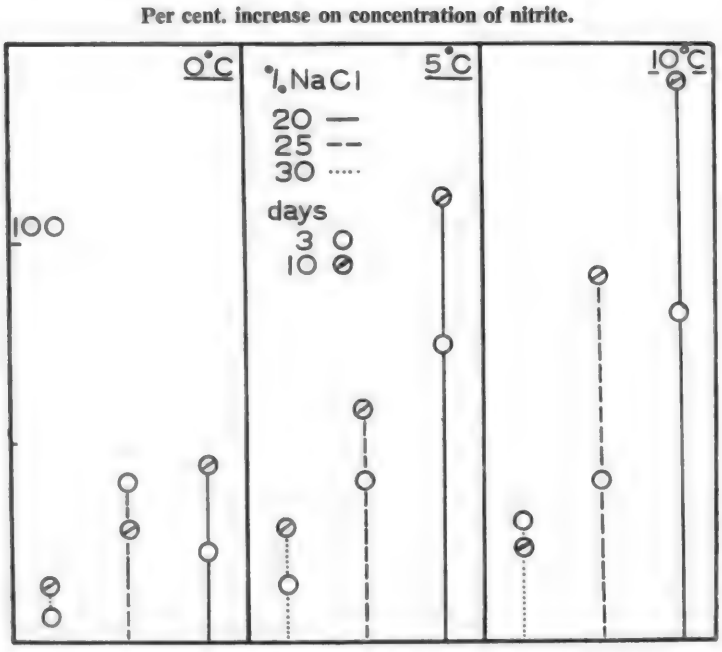


Fig. 1.—The effects of salt concentration and temperature on the formation of nitrite in a stored curing brine.

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TABLE 7.

THE LACK OF RELATION BETWEEN NITRITE CONCENTRATION AND DEPTH IN AN UNLAYERED BRINE STORED IN A GLASS CYLINDER (DIAMETER 2·3 IN.) FOR 14 DAYS AT 5° C.

	S.G.	Per Cent. Salt.	P.p.m. Nitrite.
Initially, mixed sample ..	1·169	22·7	44
After 14 days: surface ..	1·167	22·7	219
,, ,, ,, : 4′ 8″ down	1·168	22·7	207

This proved that the variation of nitrite concentration with depth in a pickling tank was due, not to other factors which might be expected to vary with depth (such as oxygen tension or bacterial sedimentation), but to the variation in the concentration of salts.

Control of Nitrite Production

This conclusion is confirmed by the fact that in storage tanks where the concentration of salt has been equalised by mixing, the concentration of nitrite does not vary markedly with depth (Table 5) even if the brine is undisturbed.

These observations indicated that it should be possible to control the production of nitrite in a brine by alteration of the concentration of salt in it. This was first done in a laboratory experiment with stored brines. A sample of pickling brine received from a factory was divided into three portions, one of which was diluted with distilled water, the second not changed, and to the third salt was added. As mentioned above, it is usual for the nitrite content of such brines to rise on storage, and this occurred with the unaltered brine. However, the rate of increase was augmented in the diluted brine; while in the portion to which salt had been added the concentration of nitrite fell (Table 9). This provided experimental verification of the direct relation between nitrite production and salt concentration in a brine.

TABLE 8.

THE LACK OF DEPENDENCE OF NITRITE CONCENTRATION ON DEPTH IN MIXED BRINE LEFT UNDISTURBED IN STORAGE TANKS.

Example.	*A.* 3		*B.* 3·			*C.* 2.		
	S.G.	*Per Cent. Salt.*	*P.p.m. Nitrite.*	S.G.	*Salt. Per Cent.*	*Nitrite. P.p.m.*	S.G.	*Per Cent. Salt.*	*P.p.m. Nitrite.*
Initially: (mixed)	1·188	25·6	300	—	—	—	—	—	—
Finally: surface	1·184	25·7	325	1·172	23·3	34	1·164	23·7	940
,, 3′ down	—	—	—	1·173	23·5	34	—	—	—
,, 6′ down	1·184	25·7	325	1·173	23·5	32	1·161	23·5	880

TABLE 9.

EFFECT OF CONCENTRATION OF SALT ON CHANGE OF CONCENTRATION OF NITRITE IN BRINE DURING STORAGE AT 5° C.

	Diluted Brine.	*Normal Brine.*	*Brine with Added Salt.*
Per cent. salt	24·3	26·1	30·4
Per cent. change in nitrite concentration after 5 days	+18·7	+6·5	−3·7

How the formation of nitrite in a stored brine (from another source) was influenced by the salt concentration and by temperature is shown in Fig. 1. It is clear that the formation of nitrite was favoured by high temperature and low concentrations of sodium chloride. Increase of the concentration of salt above 25 per cent. checked the formation of nitrite, and even brought about a loss after three days' storage at 10° C. It may be remarked that with this brine the combination of high temperature and low salt concentration led to a rapid increase in the concentration of nitrite to an undesirably high level.

Further studies have shown that although it is usual for the nitrite to increase during storage in brines from the surface layers of pickling tanks, this is by no means true of brines in general. In samples withdrawn from storage tanks, the concentration of nitrite in some cases rises on further storage and sometimes falls, according as the concentration of salt in the brine is high or low. Examples are given in Table 10.

TABLE 10.

THE BEHAVIOUR OF LABORATORY-STORED SAMPLES OF BRINE IN RELATION TO THE CONCENTRATION OF SALT PRESENT. STORED AT 5° C.

Examples.	*A.*	*B.*	*C.*	*D.*	*E.**	*F.**	*G.**
Per cent. salt	25·9	25·1	23·3	23·3	19·8	19·7	20·1
P.p.m. nitrite:							
Initially ..	10	31	53	217	116	260	510
After 2 days	—	27	—	—	—	—	—
,, 3 ,,	2	24	30	187	—	—	890
,, 4 ,,		—		—	93	320	—
,, 8 ,,		23		—	—	420	—
,, 10 ,,				—	250		1100
,, 12 ,,				165			

* Brines used for frozen pigs, in which gross overproduction of nitrite took place.

(To be continued)

Part II of this series on "The Control of the Concentration of Nitrite in Bacon Curing Brines," which will report observations under commercial conditions, will be published in the November issue. The December issue will contain the concluding instalment, consisting of a discussion and hypothetical explanation of results, together with references to the literature.

Harvesting Sugar Beet

A PARTY, consisting of Mr. J. Bradley and Mr. W. J. West of the National Institute of Agricultural Engineering, and Mr. H. S. Taylor and Mr. F. E. Thornhill of the British Sugar Corporation, visited the main sugar beet areas in North America during September and October, 1945, to study practical operations in the field and to obtain first-hand information on the research and development work undertaken by University centres, sugar factories, and agricultural machinery manufacturers. Enquiries were also made into the production and use of segmented sugar beet seed used in America.

The results of their findings are contained in a report* which emphasises the wide variety of conditions existing in the North American sugar beet areas and shows what progress has been made in mechanisation in each major growing area. Because of this variation in conditions, several approaches have been made to the problem of harvesting by completely mechanical means and detailed descriptions are given of the principal mechanical harvesters which have been evolved. The report also outlines the methods employed in producing and sowing segmented seed, and recommends that extensive trials with segmented and decorticated seed should be undertaken in Britain.

The mission, in considering the suitability of American practices for British conditions, points out that because of the wet soil conditions prevailing in Britain special attention must be paid to improved methods of lifting in order to reduce cleaning problems. Of the various sugar beet harvesters used in America, each has its limitations under British conditions.

The conclusion reached is that windrowing of the beets and tops, together with the use of mechanical loaders, probably offers the best approach to the problems of sugar beet harvesting in this country. It is therefore recommended that American mechanical loaders should be modified for British conditions. The modifications suggested include the provision of a type of elevator which does not make use of the rod link potato chain; a mechanism for knocking the beets (such as the tined reel of the Lindeman Hall Loader); a stone separating device; and a side delivery loader with near-side delivery to fit in with right-hand drive vehicles.

The report concludes with a survey of the general lines on which research and development work are carried out in the U.S.A. This, together with the information describing the latest American machines and practices, should serve as a useful guide to all interested in promoting the mechanisation of sugar beet harvesting in Britain.

* *Mechanisation of the Sugar Beet Harvest in North America*. H.M. Stationery Office. Price 1s. 6d. net.

Frozen Baked Apples

CONSIDERABLE interest in U.S.A. has been displayed in the preparation of baked apples for relatively long-term storage, which have already appeared on the market in the frozen form. Frank A. Lee describes experimental work carried out in connexion with the preparation of this product. (*Fruit Prod. Journ.*, **26**, 12.)

The apples were cored in the usual fashion, cutting out the core from the stem end, but leaving the blossom end undisturbed so as to prevent loss of syrup during the baking process, the skin being peeled off the top of the apple and the core cavities treated with a mixture of white sugar and cinnamon. This mixture was made by mixing one cup of sugar with one teaspoonful of ground cinnamon, and was sufficient for twelve apples. The apples were then baked at 400° F. until soft. Another lot of samples was treated with white sugar and a mixture of nutmeg and lemon juice, using a teaspoonful of lemon juice to each apple. Another lot was treated with brown sugar only, and a final lot was sweetened by pouring pure maple syrup into the core cavity before baking.

The baked apples were cooled and packed into quart tub-shaped cups, the bottoms of which were lined with Cellophane and an apple set in place. This was covered with two layers of Cellophane, and another apple placed in the container. Again, two layers of Cellophane were placed on top of the apple, and the third apple put in the package. This was covered with a sheet of Cellophane, and the box was finally covered with the lid. The packages were frozen and stored at −6° F. for six months.

Wine Making

IN reading the latest publication* of Professor Cruess one is reminded of a visit paid by him to the reviewer before the war, when his omnivorous taste for full details led him to spend the whole day with his notebook constantly before him and his pencil hard at work taking down facts and figures, points of interest regarding historical monuments, and, in fact, anything which occurred to that most active mind as being of interest, either then or at a later date.

Professor Cruess has produced a book which it is difficult to assess as a technical publication in the commonly accepted sense, as he has packed into its covers an enormous amount of fascinating material which must be of interest to everyone concerned with the manufacture of wines. If the detail gets a little excessive in parts, the obvious remedy is to read his opening chapters in smaller doses, but a perusal of these chapters will give the reader a very catholic knowledge of the geographical implications of wine making, and will undoubtedly introduce him to many points of interest and value which were discovered by the author in the course of a very extensive tour of the major vine-growing areas of the world.

The technical section of the book is sound; but it could be wished that rather more stress had been laid on fundamental principles, especially those which involve biochemical considerations. This is all the more noticeable if one has been reading at the same time such a publication as *Le Vin*, by L. Genevois and J. Ribereau-Gayon, in which principles mean principles and the fullest possible consideration is given to such matters as oxidation-reduction potentials, which are becoming so important in wine-making technique.

The book would appear to have been written primarily for the American reader, and such terms as "SO_2-ing" and "sherryised" tend to grate on the English ear and have an unfamiliar aspect to the English eye. In many tables and references in the text it is noted that the figures relate exclusively to wines made in California. Throughout the book the magical phrase "*Brix* (or *Balling*)" is used in countless instances, although it is explained at the beginning that the two are identical. To a purist in wine making the phrase *Reisling-type orange wine* is almost a heresy, and to discuss the microbiology of wine making without referring to the classification system of Stelling-Dekker and Lodder is rather a grave omission.

However, these points might be regarded as splitting hairs in that they are only isolated defects in what may otherwise be considered a remarkably full and valuable contribution to the bibliography of wine making.—V. L. S. C.

* *The Principles and Practice of Wine Making*. By W. V. Cruess. 2nd Edition. Pp. 476+xii. New York. 45s. net.

Fish Freezing Afloat

FISH frozen fresh from the ocean aboard ship was one of the latest developments in the American fishing industry reported by Drs. Norman D. Jarvis and Hugo W. Nilson of the Division of Commercial Fisheries of the United States Fish and Wildlife Service at the seventh national conference of the Institute of Food Technologists, U.S.A.

Designed to process and quick freeze the catch immediately, the vessels are combination trawlers and processing plants, and include an 8,000 ton vessel especially equipped for quick freezing and canning crabs and fish.

A wide variety of machines was gradually coming into use whereby fish may be filleted, scaled, salted, smoked, packaged, or canned.

Increasing Britain's Food Production

The Government's plans to secure a £100,000,000 increase in output from British farms within the next four or five years appear impressive, even though that figure may be somewhat inflated by higher prices, so that the actual increase in volume or tonnage would not be proportionate. However, the farmers and their men through the N.F.U. and Agricultural Workers' Union respectively have promised their full support and can be relied upon to do their utmost.

FARMING is one of the few industries in which workers are not constantly preoccupied with questions of shorter hours, and strikes are almost unknown. For some years it is probable that there will be secure markets at reasonable prices for most farm produce, and this will inspire the confidence and faith needed for supreme effort. If, in addition, some of the forms and shackles of officialdom could be abolished, and better still if a substantial proportion of the innumerable hordes of officials could be transformed by fairy wand or otherwise into useful land workers, the farmer's position and prospects might almost be described as satisfactory; for among his greatest needs are more skilled labour and less meddling officialdom, as Sir John Russell truly observes in *The Times* of August 27. That same great authority is also confident that a 50 per cent. increase in farm output is possible.

Reclamation of Waste Land

The use of land for maximum human food output must of course postulate a sound knowledge of nutrition. It is therefore of interest to know, for example, that one acre of land under potatoes yields on an average 3·7 million Calories per annum, under wheat 1·8 million, and if used for grazing beef cattle only 0·16 million. Similar data for other crops, and especially for more intensive farming approaching market gardening standards, would be of interest.

Clearly the optimum use of all our land, improvement of poor land, and reclamation of waste land, are a primary essential; the more necessary in view of the limited amount in this country, and the disquieting fact that, although several hundreds of thousands of acres of marginal land have been brought under cultivation in recent years, these did not fully balance the loss to agriculture of large areas for airfields, training grounds, and munition factories. And there are bound to be future heavy demands to fulfil the high and picturesque ideals of town and country planners. Much land is still wasted or only half used.

As a result of the more intensive measures of the war period the annual output of cereals in 1946 had increased (million tons) to 7·2, potatoes 10·2, sugar beet 4·5, fodder crops 17·4, and farm vegetables 3. In addition to this latter the area under market gardening was double and reached 555,000 acres. As regards farm stock there has been a serious decline in sheep (accentuated by the disastrous winter), in pigs, and, in less degree, poultry. Sheep are particularly valuable in good farming and every effort is to be made to increase the flocks. The larger area under market gardening is of interest and could probably usefully continue on a more extensive scale. That and gardening generally, including allotments, offer the best scope for intensive cultivation, and should be encouraged to the utmost by reasonable prices and security.

According to the pamphlet just issued on a "Policy for British Horticulture," prepared by a group of Conservative M.P.s, our 60,000 horticultural growers—mostly small men—produced £100,000,000 worth of fruit and vegetables in 1946, and presumably from just over half a million acres. Imports that year were valued at £52,471,000.

Farm Mechanisation

During the last decade the importance of farm mechanisation, to make the limited labour force as effective as possible, has been well realised, and machinery to the value of £100,000,000 has been made available. Fertilisers too are an important factor, especially phosphates, but these have been in short supply for some time; measures to increase these have not been overlooked, nor has research in many directions.

Other developments during the war and pre-war periods, including price stabilisation and finance facilities, have been ably and fully described, together with the possibilities of post-war agriculture, in a series of papers read before the Royal Society of Arts, and published in book form under the title *Agriculture Today and Tomorrow*, to which, as a useful up-to-date supplement, may be added an informative article in the Midland Bank *Review* for August, 1947.

Much has been said at various times about small holdings as socially desirable and possibly offering

better scope for intensive cultivation without too great demands on the available labour, since the farmer and his family would do most of the work. No doubt the more of these the better; but the view is strongly held by some that this back-to-the-land policy should be supplemented by one of partly back to the land by provision of part-time holdings and large gardens. Such partial return to the land, with one foot in office or factory and the other on the small farm, would appear to make the best of both worlds in a highly urbanised country. This agriculture-cum-industry, as it was known in the past, is an old idea which has been applied in many ways and is not merely a new theory. Today more than ever it should help to relieve the excessive preponderance of urbanism, ameliorate some of the worst aspects of modern industrialism, *e.g.* monotonous indoor work, provide recreative occupation for leisure hours, and scope for self-help in food production. A great increase in allotments would help in this direction and probably prove the quickest short-term method; but it seems to merit some attention from our planners from the longer view.

Progress in Chemurgy

FOR many years past chemurgy, or industrial utilisation of waste material and surpluses from farm, garden, and forest, has had a great vogue in the U.S.A., and has also attracted some interest in parts of Europe and elsewhere. An extensive bibliography of books and articles in the technical press has now been accumulated.

Used in its original sense chemurgy seemed to connote industrial use of agricultural raw material in a general way, and in this sense may be said to date from 1862, when an American agricultural committee issued a report on the manufacture of wine, etc., from grapes and other fruit. But more recently it is applied specifically to working up waste materials and surplus crops, and has been suggested enthusiastically as a means of strengthening the economic position of the farmer in times of depression. Production of industrial alcohol from farm waste was among the early attempts, and was followed by soya bean products, citric acid, and other products.

Formation of Experimental Stations

Several experimental stations had been established before 1938, but in that year Congress authorised an expenditure of four million dollars for organisation of research on a large scale, including four regional laboratories at Peoria (Ill.) in the north, New Orleans in the south, Philadelphia in the east, and Albany, near San Francisco, in the west. A large amount of space in all of these, with appropriate equipment, was devoted to semi-large-scale production, on which approximate estimates of actual cost could be based. The war naturally stimulated keen interest in chemurgy but forced development into lines of immediate practical value, and wider fundamental problems had to be postponed.

Raw Materials

The following are some of the principal raw materials or groups with products obtained therefrom:

1. Farm residues generally, such as straw, stalks and stems, sugar cane bagasse, from which paper, wood sugar, lignine, furfural, etc., were produced; also from maize or rice residues a special preparation for removal of carbon deposits and oil from aircraft engines. Prospects for this latter and chemicals from lignine are considered good.

2. Lucerne, for production of so-called lucerne flour for cattle by dehydration or the like.

3. Animal oils and fats, such as lard and tallow unsuited for human consumption, for use in soap-making, emulsifiers in synthetic rubber manufacture, anti-oxidants, and lubricants.

4. Apples for production of frozen and dehydrated products from a crop not suitable for direct consumption or cider-making; various products from apple pulp and juice, including pectin and apple syrup. One use of this latter is in tobacco and cigarette manufacture. Output is about 4,000 tons from low grade apples.

5. New uses have been sought for corn starch and protein in textile and adhesive manufacture, and more especially in the production of penicillin. Since maize has been in short supply in U.S.A. and wheat relatively abundant the latter has been used to replace maize in various applications, including production of alcohol for fuel.

6. Cotton naturally figures prominently in the programme of the south regional laboratory, and in view of the competition of synthetic fibres many new applications have been studied such as the use of cotton in motor tyres, medical bandages, etc. Storage of cottonseed and production of better grade oil have also come under review.

7. On fruits generally, work similar to that on apples of unsaleable grade has been directed to frozen products, such as Velva Fruit (dessert glacé), a kind of fruit *purée* prepared from apples and other fruits, sugar and gelatin products, and said to be in great demand.

8. Skins, leathers, and tanning materials.

9. Of dairy products, 3,000 tons of lactose is now used for the manufacture of penicillin and for the production of lactic acid. Casein is employed in the production of a special type of silk.

10. Of oil bearing seeds and nuts, soya bean, linseed, and groundnuts are the main ones used. Flour is made from soya bean and linseed after oil extraction. Attempts are being made to produce a more edible soya oil and special methods evolved for the preparation of groundnut cake and protein products thereof.

11. Improved methods of keeping and storing fresh and dried eggs are being studied.

12. Improved qualities of starch from sweet potatoes are now being made. One modern plant in U.S.A. has an output of 25,000 tons per annum. The residue from sweet potatoes after extraction of starch is also utilised.

13. Tobacco.

14. In connexion with vegetables, dehydration is the principal line of work, together with certain activities directed to the utilisation of various vegetable wastes, *e.g.* in fermentation industries, production of poultry foods, and some medicinal products.

15. Starch, dextrin, and glucose syrups and allyl starch are being prepared from potatoes.

Latest Developments

Among the latest chemurgical developments is the preparation of soluble food casings from citrus peel or apple pomace, which is converted into pectinate material and thence into soluble protective casing for sausage and other food products. This has just been announced by the U.S. Agricultural Research Administration. A 2 per cent. dispersion of low methoxyl pectin is prepared, adjusted to suitable acidity, and calcium salt added to form a solution of calcium pectinate at 158° F. The product gels when cooled to 104° F. Sausage or other food product moulded to the desired shape is dipped into the solution for about three seconds, removed, and the gelled coating dried in warm air current for half an hour to form a film of good strength. If the product is boiled the film dissolves; if fried or roasted it becomes tender and edible. The coating is said to be suitable for a number of processed foods.

Bagasse utilisation is the subject of a recent publication, which contains discussions on the use of bagasse for paper-making; its chemical and physical properties, patents, processes, and localities whence obtained. An extensive bibliography* is also given. Bagasse is only one of many forms of vegetable or cellulosic waste material, of which large quantities must form a disposal problem in many food processing industries. Treatment along chemurgical lines may offer a solution.

* An interesting illustrated account of chemurgical work in U.S.A. is given by H. T. Herrick, of U.S. Dept. of Agriculture, in *Chim. et Ind.*, 1947, **3**, 440.

The Chemistry of Fats

It is significant that after the lapse of only a few years, during which a world war was being fought, the volume of research on oils and fats is such that over 100 pages have been added to the original edition of Professor Hilditch's classic, which was first published in 1939, and of which the present volume* is a revised and extended edition. Much of the work described has been available only in the original papers, but Professor Hilditch has collected descriptions, not only of his own work, but also details of research carried out in laboratories throughout the world.

Professor Hilditch has greatly extended the data on the component acids and component glycerides present in natural fats, and arising out of this work he has developed his methods of computation of glyceride composition from fatty acid composition. He emphasises the fact that his treatment is purely empirical, but it seems plain that developments in this direction are awaiting those of arithmetical mind who have the patience and industry required to calculate the possible dispositions of fatty acids among the various possible triglycerides in a natural fat.

In books published on oils and fats some twenty years ago, fats were treated as insolubly complex mixtures, the average properties of which were known. It was because of this attitude that such terms as saponification value and iodine value became popular. Now fats are regarded as known mixtures of pure compounds of known properties and predictable behaviour. This change in attitude is almost wholly due to the influence of Professor Hilditch.

The section dealing with the properties of individual fatty acids has also been extended in the light of more recent knowledge, and for the experimentally minded the technique of natural fat analysis and the method of computing the results are explained in greater detail.

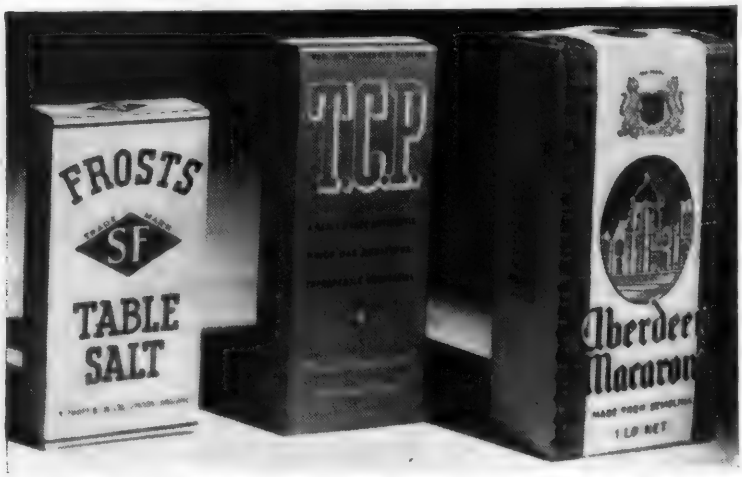
With few exceptions, only those fats whose component acids have been defined in some detail by modern methods are considered in this book. About 420 fats from plant species, 80 from land animals, and 100 of aquatic origin are mentioned, and these figures illustrate that those fats so far adequately studied are drawn from only a minute proportion of the hundreds and thousands of natural species.

The index in this second edition is improved, but the fats are still classified biologically in the index, whereas most chemists would find them easier to locate if they were classified alphabetically only.

* *The Chemical Constitution of Natural Fats.* By T. P. Hilditch, D.Sc.(Lond.), F.R.S., F.R.I.C. London. Pp. 554. Price 45s.

Enterprise Scotland Exhibition

PACKAGING DEVELOPMENTS IN THE FOOD INDUSTRY



Collapsible cartons and a carton of individualistic design for a Scottish macaroni firm shown at the Enterprise Scotland Exhibition.

Included in the Enterprise Scotland 1947 Exhibition sponsored by the Council of Industrial Design, which opened in Edinburgh on August 25, are comprehensive sections devoted to packaging and printing. Scotland has been famed for generations as a major book and colour printing country and a considerable packaging industry, located principally in Edinburgh and Glasgow, has developed.

The range of packs shown at this Exhibition demonstrate conclusively that, despite all the problems facing the packing and printing industries in Britain, marked progress has been made. Based on the qualities of excellence of design, the accepted packs may be regarded as the cream of current production.

Shortage of tinplate has had the effect of diverting certain manufacturers from that material to waxed paper, and to some extent this has encouraged an ingenuity which has produced most useful packs. An interesting example of this is the increasing use in the oatcake industry of a six-sided waxed paper drum in place of the normal circular tinplate container used generally pre-war.

Tinplate remains essentially the material for paint, tobacco, fish, broths and other products. Maconochies have redesigned their oval flat tins for herring and smoked kipper herrings with a minimum of lettering. The same policy has been followed with their Scotch broth and other products.

A selection of canned goods packed by Maconochie Bros., Ltd.

Shortage of paper is evident in the continued use of paint tin labels which cover only about half of one side of tin.

There has also been a considerable amount of redesigning done on paper and board packs as well as the introduction of some attractive new ones. A tendency towards maximum simplification of packs and the elimination of all unnecessary Victorian and Edwardian illustration, decorations and lettering is apparent. Emphasis is placed alternatively on the firm's name or the brand name and the entire design simplified to show a minimum of lettering. The danger is that this simplification may reach a stage where packs may tend to become monotonous. For example, pharmaceutical products bear almost identical lettering to a table salt and a cotton thread to a bootlace pack.

The alternative trend, noted in a pack for Aberdeen macaroni, has been to create a highly individualistic pack by substitution of 1947 motifs for the discarded Edwardian or Victorian Style. In this pack, a transparent paper one, two Gordon tartan bands border the font face vertically. The Aberdeen coat-of-arms, a medallion of a prominent city landmark, and the name in clear Gothic script complete a unique pack which still retains the clean modernity of the more stereotyped examples.

This Exhibition demonstrates that designers and manufacturers are alive to the necessity of re-planning their packaging activities to meet present-day requirements.

Emulsifying Agent

Produced in a standardised mesh size designed to give maximum thickening power, a new emulsifying and thickening agent under the name Iso powder is now appearing on the market. With wide applications in the food industry, Iso may be used in the manufacture of ice cream, jam, and sauces and as an emulsifier in the production of artificial creams, mayonnaise, cordials, fat extenders, and emulsified flavouring essences.

Sales Conference Dinner

On the occasion of the second annual sales conference of Procea Products Limited, a dinner was given at Grosvenor House at which leading representatives of the baking industry and other distinguished guests were present.

Following the proposal of the loyal toast by Mr. F. Rowlands, chairman of the company, Mr. L. Woollcott, chairman of Milkmaid Bakeries Limited, proposed the health of the company and gave an interesting review of its work from its inception and outlined the progress made. During the course of his reply, Mr. S. A. Lancaster, managing director, presented prizes to the winners of the slogan competition. Dr. D. W. Kent-Jones enlivened the proceedings with a witty speech in honour of the guests which was responded to by Dr. R. T. Colgate, chairman of the newly formed Bakers' Research Association.

After dinner the guests were entertained by the well-known artistes George Baker, Olive Groves, and Clapham and Dwyer.

Food Group Meetings

A joint meeting of the microbiological and nutrition panels of the Food Group of the Society of Chemical Industry will be held on October 8, 1947, at 6 p.m., in the rooms of the Chemical Society, when a series of papers will be presented on "Microbiological Proteins: Their Synthesis, Production, and Feeding Value."

A joint meeting of the Food Group of the Society of Chemical Industry and the East Anglian Section of the Royal Institute of Chemistry will be held on October 24, 1947, at 7.30 p.m., in Norwich City College, at which two papers on "The Herring and its Preservation" will be presented. Arrangements are also being made for members and members of the Royal Institute of Chemistry to visit Lowestoft on October 25 in order to inspect various branches of the herring industry. In the afternoon the party will proceed to the Fisheries Laboratory for a short informal discussion on "Fish Food Supply."

Aerosols and the Food Industry

An aerosol is a mist of very minute particles of a selected liquid, the particles being so small that they have the remarkable property of not depositing or wetting any surface. This means that a true aerosol of, for example, a kerosene-based insecticide carrying pyrethrins can be diffused in the presence of solid or liquid foodstuffs without any flavour being imparted to them.

It will quickly kill all accessible insects, particularly flies and moths, which are stimulated to emerge from their hiding places and fly out into the lethal atmosphere. A routine treatment is essential to deal with subsequent hatches and invaders.

The "Phantomyser" equipment supplied by Aerosols Limited is capable of continuous generation of an aerosol of any suitable liquid, and a model is available for use in larger types of factory and warehouse, etc.; also a smaller one for offices and laboratories.

The Aerosol technique is already known to be valuable in many fields including the following:

Control of insect infestation of foodstuffs, *e.g.* meat, fish, cocoa, grain, dried fruit; of textiles—clothing, warehouse stores, blankets, carpets, upholstery; and of other commodities such as tobacco.

Control of bacterial content of air in laundries, factories, offices, and shops, in fact anywhere where cross-infection increases illness and absenteeism and reduces production.

Elimination of airborne bacteria in food preservation, in manufacture of drugs and chemicals, in laboratories, and in the medical field.

Quick Frozen Food Containers

Twenty highly insulated road-rail containers of a new type are to be built by the L.M.S. Railway for the transport of home-produced, quick frozen fruit, vegetables, and meat. With a load capacity of three tons each, the new containers will ensure controlled temperature conditions from packing stations and ports to cold stores.

The Chemistry of Oils and Waxes

Designed to meet the needs of chemists engaged in industries associated with oils and fats, the course in the modern chemistry of oils and fats, given by J. H. Skellon, M.Sc., Ph.D., F.R.I.C., and arranged by the Chelsea Polytechnic, will commence on October 24 and continue until December 12.

Courses in the modern chemistry and technology of waxes have been arranged for the Lent Term, 1948. The syllabus includes specific characteristics of waxes and their classification; wax chemistry; analysis of waxes; theory and practice of wax refining; and literature of chemistry and technology of waxes. Lectures will commence on January 16, 1948, continuing until March 12, and will be given by L. Ivanovszky.

Sprayer suitable for use in the larger type of factory in the elimination of insect infestation.

Floor Heating

NEW DEVELOPMENTS

Some further details have been made available of the method of floor radiated space heating (see FOOD MANUFACTURE, July, 1947, p. 327). Described as a system of low temperature electric heating by resistance insulated cable laid below a finished floor surface of tile terrazo, cement, or prefabricated concrete slabbing, the heat is spread evenly over the entire surface by means of a system of heat conductive netting, which ensures a temperature within a tolerance of plus or minus ·5° F. throughout the whole heated surface.

Applicable principally to new constructions, since for best results the method should be adopted as a basic part of the fabrication of the building, it could be added as a superimposed layer to an existing floor. It should be noted that the system is not efficient where timber or other insulated flooring is in use.

Thermostatically and time-clock controlled, the method permits of the setting of times and temperatures to an approved pattern during off-peak-load hours, thereby leading to economy at peak-load periods. Records made at one installation show that temperature was maintained at 60° F. at four feet from the floor over a twenty-four hour period, with a variation of less than plus or minus 1° F. A further decline of only 2° F. was recorded five hours after power had been shut off and a drop of only 6° F. after eighteen hours. The average outside temperature during the period of the tests was 43·5° F.

Experience of the several installations has shown that greater comfort is achieved by a floor temperature of from 60° F. to 70° F. with a room temperature as low as 55° F., than with a room temperature of 70° F. and a floor temperature of below 60° F.

An important fact is the relatively slight loss of temperature resulting when doors or goods entrances are opened due to the fact that the principal source of heat is by direct radiation rather than by heating the air mass. Installation costs are competitive with other methods of space heating and operational costs 25 per cent. to 33 per cent. below the comparable all-electric standard.

Booklets Received

Aimed at providing a simple exposition of *p*H measurement, the booklet *Hydrogen Ions* published by Marconi Instruments Limited includes summarised descriptions of various types of up-to-date *p*H measuring equipment. A special section is devoted to the characteristics of the glass electrode and an appendix incorporates details of the methods adopted for the standardisation of *p*H measurements.

*

A comprehensive catalogue containing not only a price list but many valuable facts and figures in connexion with the flavour and essence industry has been produced by A. Boake, Roberts and Co., Ltd. Divided into two parts, the first section contains all types of essence and flavour listed together alphabetically and describes their salient characteristics together with a general indication of their uses, the second giving the individual doses and uses, spirit contents, etc.

Published in loose leaf form and containing coloured and other illustrations, this catalogue should be of lasting value to those interested in this industry.

*

A fully illustrated and well produced booklet has been issued by The Farrar Boilerworks Limited, to mark the celebration of their Diamond Jubilee. Founded in 1887 by Alfred Farrar, the business was purchased and formed into a private limited company in 1912 by the late Sir Louis W. Smith, M.P. The present Board of Directors consists of H. A. Sisson, O.B.E., M.A., F.C.A. (chairman), John E. Palmer, M.I.B.E. (managing director), Alderman George Clark, J.P., M.I.M.E., and Major Sir Hugh Cholmeley, Bart., D.S.O.

*

The July issue of *The Purchasing Journal* includes a full report of the Cheltenham Conference held from June 13 to 16, 1947, at which papers on "The Purchasing Department as seen by the Works Manager," "The Purchasing Officer's Responsibility in Industry," and "Some Thoughts on the Future of Industry," were read.

*

A new publication, *The Aluminium Courier*, issued by the Aluminium Development Association, is designed to encourage the correct and increasing use of aluminium and its alloys. The first issue of this quarterly periodical deals with structural engineering and building and consists of a review of achievements with aluminium in this field.

*

An attractive little illustrated booklet has recently been published by the Kleen-e-ze Brush Co., Ltd. It contains a brief review of early brushmaking history and also a description of brushmaking in modern days.

The different materials entering into the manufacture of brushes are discussed in an interesting manner.

Closures for Food Packs

Consisting only of a wire enclosed between two strips of paper, the Fold Hold bag closures are easy to affix. When the bag is ready for sealing the clip is placed across the bag about half an inch from the opening. The top of the bag is then folded over twice and the projecting ends of the Fold Hold bent back, thus forming an airtight and moisture-proof closure. By reason of these characteristics the clips, manufactured by Kleen Klips Limited, were the standard closure for the individual salt ration bags of troops stationed in the Eastern theatre of war, and over one thousand million were manufactured during the war.

Visit to South Africa

Accompanied by Mr. E. R. Brooker, director and secretary, Mr. G. Havinden, chairman of G. Havinden Limited, is visiting South Africa with a view to examining food production in that country for the U.K. market. The tour, of approximately three months' duration, will cover the whole of the Union of South Africa, Rhodesia, Kenya, Egypt, and the Sudan.

The Nutrition Society

The Fortieth Scientific Meeting of the Society (the twentieth of the Scottish Group) will be held in the Strathcona Club, The Rowett Research Institute, Bucksburn, Aberdeenshire, on October 18, 1947, which students and members of other scientific Societies are invited to attend.

The following papers will be read:

(1) The digestibility of edible vegetable oils, by J. T. Abrams, G. C. Ashton, M. Ritson, and H. Wilkinson.

(2) The neglect of "nutritional" genes in the selection of ewe lambs for Scottish hill flocks, by George Dunlop.

(3) Anaemia and marasmus occurring in Indian troops on active service, by R. H. Girdwood.

(4) The metabolism and physiology of the lactating cow as affected by thyroxine. I. Nitrogen metabolism on different planes of nutrition, by Edwin C. Owen.

(5) The incidence and course of a virus infection (strawberry footrot) in sheep on two different planes of nutrition, by S. T. Harriss.

(6) Nutrition and other factors in the rearing of piglets, by W. Thomson, A. W. Biggar, and R. Cook.

(7) The use of mice for testing the influence of diet on capacity to resist infection, by J. W. Howie, S. T. Harriss, W. G. MacLeod, and E. B. Reid.

(8) The influence of manurial treatment on stem-end blackening of potatoes, by J. C. Thompson.

(9) The fodder grass consumption of tropical dairy cattle; a problem in milk production, by J. Duckworth.

(10) The influence of ascorbic acid on the regeneration of epithelial structures in guinea pigs, by N. M. Galloway, R. C. Garry, and A. D. Hitchin.

Major J. S. Baker

We announce with regret the death of Major J. S. Baker, O.B.E., director of Baker Perkins Limited, and past chairman of the Company.

Of all the Baker Perkins organisation J.S.B., or Joe as he was affectionately and universally called, was the best known because, after serving his time in the Shops as a youngster, he selected sales representation as his career; in that capacity he literally travelled the world and thus became known to thousands. But he was other things besides. His great ability and versatility contributed in immeasurable degree to the growth of Baker Perkins during his lifetime. He saw ahead in countless ways and from many aspects, not with any specious gift of prophecy but by highly intelligent reasoning. Because of those qualities his loss is a great one to his executive colleagues, while his subordinates will remember him best for his unqualified loyalty and justice to them and for his wise counsel and example.

A younger son of Joseph Allen Baker, M.P., and grandson of the founder of Joseph Baker and Sons which became Baker Perkins, J.S.B. was only sixty-six years of age, but for a long while he had endured painful ill-health with great fortitude, including the disability of a wound sustained in the first World War when he served with the Leinster Regt.

At the end of 1946 he retired from the arduous position of member of the B.P. Board of Management, under the age-limit imposed upon themselves by the directors, but his colleagues were happy to avail themselves of his courageous readiness to continue to serve and he retained his directorship to the time of his death.

Mobile Cranes

Powered by Diesel engines, Jones' mobile cranes, marketed by George Cohen, Sons and Co., Ltd., are manufactured by one of their associate companies, K. and L. Steelfounders and Engineers Ltd.

Among the models available are:

The "Super 15," which handles loads up to 15 cwt. and can lift and travel, or lift and slew, under its own power.

The "Super 22," which handles loads of up to 2 tons. It is suitable for manœuvring in restricted spaces, and the driver's cab is so arranged that he has all-round vision. The superstructure revolves through 360 degrees, and all motions are power-operated.

A crane capable of handling loads of up to two tons.

Models with pneumatic tyres fitted with special restrictor rings to protect the side walls of the tyres when working on difficult ground, to assist travelling on soft ground, and to ensure stability in the event of a puncture are available.

Radiant Heating Oven

RECONSTITUTION OF PRE-COOKED FOODS

Primarily designed for the reconstitution to serving condition of pre-cooked food, this oven can also be used for ordinary cooking.

Constructed mainly of corrosion-resisting aluminium alloy, the oven (Patents applied for) measures overall 35½ in. wide, 30 in. high, and 17½ in. back to front. It is divided roughly into two equal parts, one the oven and the other a hot-cupboard, each measuring 15 in. wide and 12 in. deep, and both enclosed by side hinged doors.

The oven compartment is provided with nine radiant heating elements of the flat plate type, arranged horizontally and dividing the oven into eight shallow sections. In each of these eight sections is inserted a rustless carrier bearing four standard aluminium food containers, so that the oven has a capacity of 32 containers.

The average time taken to reconstitute one complete charge of the oven, starting up from cold with the trays and contents at 0° F., is 50 minutes.

Four warming elements can be taken from the oven and used in the hot-cupboard instead. By this means dishes of exceptional dimensions, such as joints or large fowls, can be reconstituted separately in the top part of the hot-cupboard. In the lower section a single element is provided to maintain an inside temperature of 160° F. to retain the warmth of dishes transferred from the oven.

Control of the elements in the oven and hot-cupboard is by hand switches with thermal overload trips. Dial type heat gauges are fitted to the doors of the oven and hot-cupboard to warn the steward that the point at which the food has become unfrozen has been reached. Beyond this point the temperature rises very rapidly. The hot-cupboard maintains a steady temperature of 160° F. so that prepared meals may be kept at the correct serving temperature. A thermostatic limit switch prevents damage to the whole unit should the current be left on when the oven is not actually in use. Pilot lights show when any part of the circuit is "live."

Insulation against heat loss is effected on the principle that highly polished aluminium reflecting surfaces greatly retard heat transmission. The system is effective and an appreciable saving in weight is gained. Electricity consumption is 3,000 watts.

The equipment is manufactured by Richard Crittall and Co., Ltd.

Rose Hips by Rail

Arrangements for the rapid transit of over 100 tons of rose hips to factories at Acton and Coleford (Glos.) for the extraction of a valuable vitamin C syrup are being made by the G.W.R.

The gathering of the berries will go on from now until the end of November under the organisation of the County Committees in the South, West, South-West, Midlands, and Wales.

Agriculture Group Programme

Forthcoming meetings of the Agriculture Group of the Society of Chemical Industry are as follows:

1947.

October 21. "Fertiliser requirements of wheat as determined by field trials." Dr. G. A. Cowie, Potash Limited, Fenton House, 112, Fenchurch Street, London, E.C.3.

November 18. "The role of chemistry in recent developments of animal insecticides." Dr. R. S. Cahn, The Cooper Technical Bureau, Berkhamsted, Herts.

1948.

January 20. "Recent studies in the composition of milk." Dr. S. J. Rowland, National Institute for Research in Dairying, Shinfield, Reading.

February 17. (i) "Methods of determining mineral deficiencies in plants." Profesor T. Wallace, C.B.E. (ii) "Chemical tissue tests for the determination of mineral status of plants." Dr. D. J. D. Nicholas, Long Ashton Horticultural Research Station, Bristol.

March 16. "Some aspects of vegetable nutrition." R. M. Woodman, Horticultural Dept., School of Agriculture, Cambridge.

April 20. "Carbohydrate metabolism in soil." Dr. W. G. C. Forsyth, Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen.

May 22. Annual General and Summer Meeting at 12 noon, East Malling Research Station, Maidstone, Kent, by kind permission of the Director, Dr. R. G. Hatton, C.B.E., F.R.S.

All meetings, unless otherwise stated, will be at 2.30 p.m. in the Chemistry Department of the Royal College of Science, Imperial Institute Road, South Kensington, London, S.W.7., and are open to all.

FOOD IN PARLIAMENT

Poor Fish

"I believe that the fall in the home demand for kippers this year is due more to the poor quality of the herrings landed at the Moray Firth ports and to the warm weather than to any general decline in kippering standards," said the Minister of Food recently. He was answering a question from Mr. Robert Boothby, who suggested that the explanation was insufficient smoking and that the remedy lay in legislation to prescribe a minimum period of smoking or, alternatively, to prohibit the use of dye in the processing of kippers. Mr. Strachey rejected this suggestion, quoting the opinion of the Advisory Committee on the subject, which came to the conclusion that little practical good would be achieved by such legislation, but that improvement in quality could best be served by continued and rigorous inspection, carried out by officers of the Ministry of Food. The Minister concluded: "The rise in home consumption which continued until this summer seems to have justified this conclusion, and I see no good reason to abandon the present policy because of a decline, which I hope is only temporary, in the quality of the herrings."

Tinplate Outlook

British users of tinplate will have to rely on domestic sources of supply for some time to come, according to a recent reply in Parliament by Mr. C. P. Mayhew, of the Foreign Office, who saw no prospect of imports of tinplate from Germany during 1948. All German strip mills were working on restricted fuel and power supplies, although none was entirely idle.

The question of the future of the British tinplate industry was raised by Mr. David Grenfell, who asked the President of the Board of Trade why the location of the new cold reduction mill had been changed from Swansea to Llanelly, which, he stated, was a much more expensive site. Sir Stafford Cripps replied that the decision had been reached after consultation with the local authorities, the Steel Board, and the regional officers of the Departments concerned and declined to go into further detail, although heavily pressed by Mr. Grenfell.

Processed Milk

The change in the proportion between deliveries of milk for liquid consumption and for manufacture since 1938 were shown by a recent reply of the Minister of Food to a question from Mr. J. L. Williams, M.P. Here are the statistics he gave for Great Britain, reduced to tabular form (figures are for millions of gallons):

	1938.	*1946.*
Total production ..	1,210	1,424
Liquid consumption	845	1,265
Manufacture ..	365	159

Mr. Strachey said that no whole milk was used in 1938 for other manufactured goods, but 8,000,000 gal. of skim milk were used for the manufacture of casein. He was again called on to deny that milk was used for manufacture of such articles as buttons and umbrella handles, as in 1938.

Overseas Food Corporation

Mr. Strachey gave no confirmation of the report that a grant of £50,000,000 had been made for purchases in connexion with Australia's part in the effort to secure increased Dominion production of foodstuffs needed by this country, in reply to a recent question in Parliament. He did say, however, that he had read the dispatch with interest, and indeed pleasure, to find that our Australian friends were keen, but it was a little premature in view of the fact that the Overseas Food Corporation is not yet set up.

Egg Packing Stations

About 70 per cent. of the estimated production of eggs from agricultural holdings for the year ended May 31, 1947, was sent to packing stations licensed by the Ministry of Food. Giving this figure in Parliament in answer to a question, Mr. Strachey gave no definite opinion on whether the proportion was as high as it could or should be, saying: "We have, of course, to allow for the fact that some eggs are consumed in the households of producers, and that some are used for hatching, but we should like to keep the proportion as high as possible."

Food Machinery

The figure of £420,000 was given as the total value of exports of bakers' and confectioners' machinery (including machinery for sweet making) during the first half of this year by Mr. J. W. Belcher, Parliamentary Under-Secretary to the Board of Trade, in answer to a question in the House of Commons. Of this, £87,000 went to hard currency countries, £252,000 to the sterling area, and £81,000 to other countries.

Food Subsidies

In answer to a question as to how the anticipated total of £392,000,000 to be spent on food subsidies during the current financial year will be distributed between commodities, the following figures were given:

	1947-48. *£ Millions.*
Bread and Flour	77·2
Eggs—fresh, frozen, and dried	21·7
Meat and Livestock ..	53·0
Milk	28·0
Potatoes	26·5
Sugar	24·3
Cheese	23·4
Butter	26·0
Margarine, Cooking Fats, and Oils	3·1
Bacon and Ham	16·7
Tea	3·1
Other Foodstuffs ..	Cr. 2·9
National Milk and Milk-in-Schools Schemes	33·4
Other Welfare Schemes ..	3·6
Animal Feedingstuffs ..	42·7
Fertilisers	8·2
Contribution to cost of New Zealand Government stabilisation policy in respect of food production ..	4·0

Mr. Gordon Russell

The Council of Industrial Design have appointed Mr. Gordon Russell, C.B.E., M.C., R.D.I., F.S.I.A., Director of the Council.

New Baking Research Institute

AMBITIOUS PROGRAMME PLANNED

Housing for the laboratories of the British Baking Industries' Research Association has now been found at Chorleywood Lodge, Chorleywood, Herts. It is intended to organise in the building as quickly as possible a library, together with chemical, analytical, physical, microbiological, and bacteriological laboratories, and to make use of existing outbuildings to install an experimental bakery where, in collaboration with the laboratories, small-scale study of all types of processes involved in the baking industry will be carried out.

Some of the laboratories should soon be in operation, the necessary apparatus being available. It is hoped that the present staff will be increased to twelve by the end of the year, and Dr. J. B. M. Coppock, the director, aims at a staff of fifty within five years, half of which would be practical technicians and the other half fully qualified scientific graduates.

In the meantime the Royal Technical College, Glasgow, is carrying out research for the Association and arrangements are being made with other organisations to do likewise. Some of the subjects scheduled for early investigation are: nutritional factors, fermentation, the properties of dough with particular reference to its ripeness, the nature of flour suitable for biscuit manufacture, the application of such developments as electronic heating to the industry, the study of emulsions and extenders, and examination of the suitability of new materials for the industry. Dr. Coppock is particularly concerned with the protection of the consumer through study of materials and equipment used in baking and through care for the health of bakers and their assistants.

Largely dependent on the baking industry to carry through these projects, the Association is now starting a drive for membership (see FOOD MANUFACTURE, July, 1947, p. 328). The subscription is a basic rate of £2 per firm plus a research subscription according to the size of the firm ranging from £2 to £123.

Members of the Council, under whom the Association has made rapid progress since its inception in September of last year, are as follows:

Chairman: R. T. Colgate, D.Sc., F.R.I.C.

Representing members in Scotland: G. Russell Austin, Bellshill; J. R. MacLeod, B.Com., C.A., Glasgow.

Representing members in Wales: G. Franklin, Cardiff.

Representing members in Northern Ireland: D. L. Baine, Belfast.

Representing biscuit manufacturers in any part of U.K.: R. T. Colgate, D.Sc., F.R.I.C., Reading; S. H. Elkes, M.B.E., J.P., Uttoxeter; Wilfrid Hughes, Birmingham.

Representing large bakers and flour confectioners in any part of U.K.: F. K. Birkett, B.Sc., Stockport; R. N. Cannon, M.A.(Cantab.), London; E. F. Mitchell, Worthing.

Representing small bakers and flour confectioners in any part of U.K.: J. H. Beale, M.B.E., London; A. Bostock, Manchester; H. J. Penny, Hove.

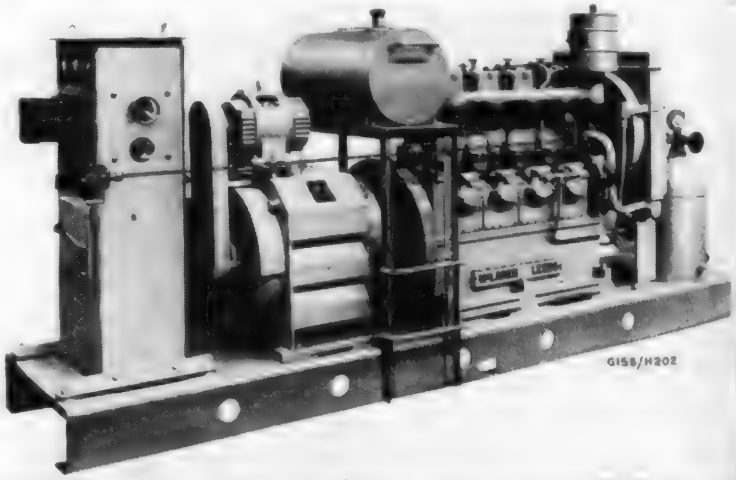
Co-opted by Council: Professor H. D. Day, C.B.E., D.Sc., F.R.S., Reading.

Director of Research: J. B. M. Coppock, B.Sc., Ph.D., F.R.I.C.

Secretary: S. T. Killick, B.Com., A.C.I.S.

Appointment

The appointment of Mr. R. F. Hanks and Mr. S. V. Smith to the Board of Directors of Morris Motors Limited has been announced. Both new directors have served the Company in a number of capacities for long periods.



Electric generating set shown at the recent Engineering and Marine Exhibition.

Diesel-Electric Generators

The A.B.O.E.-Brush 55kw. diesel-electric generating set comprising a McLaren "MR4" four-cylinder totally enclosed, high speed, four-stroke cycle, airless injection engine rated at 88 B.H.P. at 1,000 R.P.M., direct coupled to a Brush 55kw. 400/230 volt., 50 cycle, 3 phase, ·8 p.f., 4-wire alternator complete with direct coupled exciter and shunt field regulator and with Brush switchgear all mounted on a combined bedplate, was one of the exhibits shown by the Associated British Oil Engines Limited and British Oil Engines (Export) Limited, at the recent Engineering and Marine Exhibition held at Olympia.

The allocation of materials for the manufacture of 1,500 of these sets was sanctioned by the Ministry of Supply in March of this year.

Tube Closing Machinery

A new machine for the closing of collapsible tubes of varying sizes is announced by Richard Brandt Automatic Machines. Fed into the machine in an upright position, it is possible for tubes filled with liquids of low viscosity to be closed and the flat squeezing, double folding and subsequent pressing down of the fold, crimping and code or number stamping is effected in a single operation. Tubes are given a completely airtight closure and the provision of an automatic stop prevents the operation being inadvertently repeated with consequent possible damage to the tube. Of a bench type, the machine is economical in operation and has an output approaching that of automatic machines.

Ball Float Steam Traps

The ball float type of steam trap (with inbuilt automatic air release) is generally recognised as the right choice for steam-heated equipment where the extreme conditions of a heavy starting load and a light running load of condensate have to be met. It is the best type for these conditions because of its ability to operate equally well on heavy or light loads and on fluctuating steam pressures.

The series of ball float types in the Spirax range of steam traps is being considerably extended, and the FT-71 has at the maximum pressure differential of 200 psi a condensate discharge capacity of 2,320 lb. per hour. A companion pattern, the FT-72, has at its maximum pressure of 120 psi a discharge capacity of 3,450 lb. per hour.

Further traps of the same pattern, but for lower working pressures, are becoming available and will have discharge capacities ranging between 15,000 and 20,000 lb. per hour.

The new trap which replaces the old FT-0 is designated FT-62 for pressures up to 120 psi, FT-63 for pressures up to 60 psi, or FT-64 for pressures up to 15 psi. Condensate discharge capacities per hour are 1,840 lb., 2,550 lb. and 2,975 lb. respectively.

SCRIBBANS-KEMP LIMITED

A SATISFACTORY YEAR

The twentieth annual general meeting of Scribbans-Kemp, Limited, was held on September 11 in London.

Mr. Louis Nicholas, J.P., F.C.A. (the chairman), presided.

The following is an extract from his circulated statement:

That the company and its subsidiaries, notwithstanding the limitation of supplies, rationing, increases in the cost of labour and raw materials, have had a satisfactory year. Owing, however, to the cessation of war contracts and the difficulty of immediately increasing the prices of our products to cover the increased costs, while some of our subsidiaries showed increased trading profits, the trading profits of the group taken as a whole were somewhat smaller.

The increase in the net profits is the result of the lower charge for excess profits tax. Your directors have increased the total dividends payable for the year upon the Ordinary shares from 6 per cent. to 7 per cent., and upon the Deferred shares from 17 per cent. to 19 10-12ths per cent., and have carried £100,000 to reserve, which will bring the amount of this account up to £375,000.

We have again had difficulty, owing to the limited range of materials available, in maintaining the high standard of our products, but have done our best under the circumstances, your directors considering that it is essential for the future of the company that the high quality of its products should be maintained as far as possible. Owing to the shortage of raw materials we have not been able to satisfy the demand for our goods.

The very wide distribution of our products requires a large amount of packing materials, and it is a matter of great regret that the supply of packing materials, now extremely scarce, is causing considerable anxiety and may have some limiting effect upon our distribution.

During the year under review we have established a research department under the control of a distinguished scientist who will be assisted by a fully qualified staff. This is a long-term policy and your directors are satisfied that it is a proper course to adopt.

I am pleased to say that the first year's trading of the Halifax company, which was purchased last year, is very satisfactory, fully justifying this purchase.

With regard to the consolidated balance-sheet, the reserves of the group now amount to the sum of £2,343,237, as against £1,814,065 last year.

In view of the uncertainty as to future supplies, prices, and restrictions, it would be most unwise for me to endeavour to foreshadow the result of the current year's trading, but for the first three months of the current year the profits of the group are fully equal to those of last year.

The report was adopted.

*

At the nineteenth ordinary general meeting of the St. Martin Preserving Co., Ltd., Mr. P. A. J. Hammett presiding, a dividend of 10 per cent. was approved.

*

A final dividend of 6 per cent. on the Ordinary shares, making 10 per cent. for the year, was recommended at the fourteenth annual general meeting of McDougalls Trust Limited under the chairmanship of Mr. Kenneth A. E. Moore.

*

The net amount available for dividend on the Deferred shares and for reserve after paying all charges, including Preference dividends and taxation, was £504,409 as against £386,326 in 1946. These figures were included in the chairman's speech circulated with the report and accounts presented at the nineteenth ordinary general meeting of Beecham Group Limited, Sir J. Stanley Holmes, M.P., chairman and managing director presiding. The directors have already declared and paid interim dividends of 36 per cent. amounting, less tax, to £299,475, and recommended that a final dividend of 4 per cent. be declared and paid, amounting, less tax, to £33,275.

The retirement of Sir Geoffrey Peto and Mr. Charles Spiers, senior directors of the Morgan Crucible Co., Ltd., was announced at the thirteenth annual general meeting of the Company, Mr. P. Lindsay, O.B.E., M.C. (chairman), presiding. Mr. J. Walker, a senior member of the technical staff, has been appointed to the Board of Directors.

*

A further outstanding advance in technique, turnover and profit was made over the past twelve months by B. Young and Co., Ltd., gelatine manufacturers. This was reported to shareholders of the parent company (British Glues and Chemicals Limited) at the annual general meeting on July 30.

The chairman of British Glues (Mr. Roger Duncalfe) commented: "The output of Spa Brand Low Melting Point Pure Food Gelatine (now saleable in pre-packed form) has been greatly increased, but the public demand for this much-sought-for gelatine of great purity produced under strictly controlled hygienic conditions still far exceeds the supply. Flavourings in powder form have been added to the 'Spa' range during the year and have been well received."

Reference was also made to a £300,000 programme for reconstruction and development in the Group's United Kingdom factories.

Changes of Address

The address of British Industrial Solvents Limited is now 4, Cavendish Square, London, W.1. Telephone: Langham 4501. Telegrams: Bissolv Phone London.

*

As from August 29, the address of Palorit Limited, Pal Chemicals Limited, and Pal Products is Palorit House, 11, Harrow Road, London, W.2. Telephone: Paddington 8261/2/3.

*

New offices for the Ice Cream Alliance have been obtained at 92-94 Gray's Inn Road, Holborn, London, W.C.1. (Telephone: HOLborn 4720.) The headquarters staff has moved there from Walter House, Bedford Street, Strand, and all communications should now be sent to the new address.

*

The National Institute of Agricultural Engineering is now being transferred from its temporary war-time location at Askham Bryan, York, to permanent headquarters at Wrest Park, Silsoe, Bedfordshire. Telephone No. Silsoe 305. Telegraphic Address, Ninagen, Silsoe.

OBITER DICTA

- The meat just came and I said I would have it.—*A butcher in the Halifax Borough Court.*
- *Hon. Members:* What is a "spiv"?
  Mr. Hogg, M.P.: A Minister without portfolio.
- We want food and work before ideologies.—*Mr. W. G. Worsfold, a member of the Society of Individualists.*
- I have an old lady customer who is aged 103, and I allow her one pint of milk a day and don't care who knows it.—*Wiltshire dairyman.*
- There's a prepared piecrust on the market called 7-Minit Pie Crust. The directions on the box say "Bake 25 minutes."—*"New Yorker."*
- The world has almost every kind of government except the kind they promised to be.—*Irish Agricultural and Creamery Review.*
- The optimist is a man who says: "My glass is half full." The pessimist is a man who says: "My glass is half empty."—*Peterborough, "Daily Telegraph and Morning Post."*
- There is no meat rationing in Eire. It is a rich man's paradise; one can go into restaurants in Dublin and have steak, loin of mutton, and anything one fancies.—*Sir R. Ross, M.P.*
- Is it significant, do you think, that when the Minister of Food recently released more meat for sausages the café where I go for lunch altered "toad-in-the-hole" on the menu to "sausage-in-the-hole"? — *Peripatetic Correspondent, "The Lancet."*
- It will surprise nobody to learn that Government experts are investigating the possibility of making sausages from grass. We can but welcome with modified rapture any sausage content providing an alternative to the present mixture.—*"Yorkshire Post."*
- She (Mrs. L. Manning, M.P.) laughed delightfully at my mention of bacon and eggs, and I regret that because of administrative bungling by the Government, particularly by the Minister of Food, she cannot have her desire for bacon and eggs fulfilled. — *Mr. Turton, M.P.*

New Croydon Factory

Plans for the building of a new and modern factory at Croydon, Surrey, by Dubuis and Rowsell Limited, manufacturers of fruit juice extracts and flavouring essences, have now been passed by the Ministry of Town and Country Planning. Temporary extensions to the existing laboratories and works are now completed pending the construction of the new factory.

Australian Contract Concluded

The contract for the new Yallourn Power Station, which has a value in Australia of over £2,047,000, was concluded by Mr. Edward Thompson, managing director of the John Thompson group of companies, during his recent visit to Australia, New Zealand, and South Africa.

Mr. Thompson also visited agencies over the entire Commonwealth of Australia and New Zealand, also South African subsidiary companies.

British Industries Fair, 1948

The next British Industries Fair is to be held in London and Birmingham from May 3 to 14, 1948. Those wishing to exhibit should complete the usual form of application obtainable from the Export Promotion Department of the Board of Trade, 35, Old Queen Street, London, S.W.1. It is emphasised that prospective exhibitors should make early application, as there is every indication that demands for space are likely to be heavy.

OVERSEAS ITEMS

American Dairy Association

Formed as a medium for the interchange of information and a method for stimulating the development of dairying and dairy processing all over the world, the Dairy Industries Society, International, is proceeding to publish for world-wide distribution a series of seven handbooks for milk producers and dairy processors, prepared by sub-committees of practical experts. A comprehensive bulletin, the first in a series of periodic information communications, is now available.

Food Technology

Specialising in the field of processing and packaging of foods and other products, C. Olin Ball has announced the establishment of his business as consulting food technologist (with associates in allied lines) at 408, East Broadway, Maumee, Ohio.

The recipient of the 1947 Nicolas Appert medal awarded annually by the Chicago section of the Institute of Food Technology, Dr. Ball specialises in heat sterilisation of foods. In accepting the medal Dr. Ball read a paper on the use of mathematics in research, explaining how mathematical analyses might eventually make needless a great deal of laboratory experimentation.

Winter Food in France

Grave warnings of food hardships in France this winter were given in Paris recently by both M. Paul Ramadier, France's Socialist Prime Minister, and the Executive Committee of the Socialist Party. Shortages and restrictions in France were expected to be even worse than in Britain.

M. Ramadier said that the harvest this year was very much less than requirements and that there was no chance of getting the quantities of which they were deficient from abroad. The world harvest was deficient, particularly in the U.S.

The Government was considering the following measures to mitigate the wheat shortage:

(1) Improvement of methods of harvest collection;

(2) The raising of the roughage content of flour by four per cent.;

(3) The closing of bakeries for an extra day each week, making two days in Paris and three in the Provinces;

(4) The reduction of the basic bread ration from 250 grammes (nearly nine ounces) to 200 grammes (about seven ounces) from September 1.

Preservation of Fruit and Meat

A method of food conservation recently evolved by Professor O. Sovtchouk of Tomsk University is reported as being used in the Soviet Union "in an effort to improve the condition of food and perishable food products which have to be transported over the vast distances of the Union."

The method followed intensive research on horseradish and garlic, from which substances with antiseptic properties were extracted. These "substances" are placed in a glass jar which opens into a tray with cut-out shapes on which the fruit and other foods to be preserved are placed. This tray forms the base of an upper jar which is completely airtight, thus allowing the antiseptics to act on the foodstuffs.

By Professor Sovtchouk's method it is claimed that meat may be kept fresh for from ten to fourteen days and fruit preserved over a period of eighteen months without losing their original freshness. It is hoped that the method will assist in securing an equitable distribution of food from large production areas to highly industrial centres, but no details are to hand regarding the practical application of the process for bulk transport.

Margarine in Durban

Production has started at South Africa's margarine factory, established at Durban, where it is expected to produce 600,000 lb. of margarine a month. It is hoped to increase output to 1,500,000 lb.

Australian Aluminium Plans

The Australian Aluminium Production Commission is charged with the task of building an aluminium industry in Australia from finances jointly provided by the Commonwealth Government and the Tasmanian Government.

Electric power accounts for the largest single item in the cost of producing aluminium. The cheapest source of electricity is from a hydro-electric power scheme, a suitable hydro - electric scheme existing within a few miles of Launceston, Tasmania, and a site on the banks of the Tamar River has been tentatively selected for the establishment of the Australian aluminium industry, which will produce 10,000 tons of metal per year.

Fruit preserved by this Russian method is said to retain its freshness for eighteen months.

The Canadian International Trade Fair

TORONTO, MAY 31 TO JUNE 12, 1948

Many special services for foreign and domestic exhibitors have been arranged by the directors of the first Canadian International Trade Fair, which will be held under the management of the Canadian Government in Toronto, May 31 to June 12, 1948.

The booths are a new type of modern pre-fabricated design and are provided without extra charge in the cost of floor space. There will be an open booth for displays of heavy industry, while light and medium industries will be displayed in a closed booth of the same general design.

More than four times the space originally estimated has already been applied for by Canadian firms intending to exhibit their products, and four hundred and eighty manufacturers and producers from all parts of the world have so far requested reservations for 106,980 square feet of display space for products ranging from hairpins to aeroplanes.

Closing date for applications from foreign exhibitors was September 1, after which an accurate estimate of the number of displays expected from abroad will in due course be made. However, substantial numbers of applications are already in from manufacturers in a score of foreign countries, including Borneo, Belgium, Turkey, India, Thailand, Iran, Italy, Germany, France, Holland, China, Switzerland, British West Indies, and Latin-American countries. Substantial representation is also indicated from the United Kingdom, the United States, and Australia.

More than 100,000 official invitations to attend the Trade Fair were distributed in five languages during September to buyers and buying organisations abroad. Further to ensure attendance by buyers from all parts of the world, a comprehensive advertising campaign will be directed to them in the leading British and American international magazines, in addition to local publications which will carry the message in approximately fifteen languages in more than sixty different countries.

The assurance of success for the first Canadian International Trade Fair is especially heartening to Canadian manufacturers and producers who, by the summer of 1948, may be looking further afield for markets to maintain and expand production. The fair will come at a time when many of our loans and credits to foreign nations may be approaching exhaustion and Canadian export trade seriously affected by the dollar volume of imports. In this respect the Canadian International Trade Fair will afford all buyers the opportunity of seeing what can be obtained and so create further markets abroad.

Eire's Milk Tribunal

Food industrialists in Eire engaged in the manufacture of milk products welcomed the recommendations in a recently issued report of a special Milk Tribunal set up by the Eire Government in 1945.

The Tribunal considered that while improvement had been made in the quality of milk supplied over the last ten years, the milk industry in the Dublin area had not been adequately fostered from the agricultural point of view. The adoption of a new milk policy and the establishment of a Milk Board were urged. It was recommended that such a Board should have wide power over the production and distribution of milk in the production district, and its duties would include the development and fostering of production and the stimulation of consumption. Plants for the pasteurisation of milk or the manufacture of milk products should be provided by the Board where necessary, and these would solve the problem of surplus milk during periods of flush production.

A Consultative Council, consisting of representatives of producers, distributors, and consumers (and including also some specialists in the scientific and technical aspects of the industry) should be established to advise the Board.

Also recommended by the Tribunal were the initiation of schemes by the Department of Agriculture for the improvement of dairy stocks and the control of animal diseases, and that milk sold should be limited to highest grade milk and pasteurised milk. Control of milk prices should be continued and costs of production and distribution periodically investigated.

This was the first Milk Tribunal held in Eire since 1926, previous investigations into the milk position being held in 1918 and 1911.

Australian Rice Harvest

The rice harvest in Australia has averaged just on 30,000 tons a year for the past five years. This year, the Rice Marketing Board has just announced the bumper harvest of 55,250 tons. Under agreement with the United Nations Food and Agriculture Organisation, all but about 8,000 tons of Australia's rice is earmarked for export. The 8,000 tons is reserved for Chinese nationals and other Asiatics living in Australia, for hospital patients, and to supply ships carrying Asiatics as members of their crew. All the rest is sent to feed Malayans and other British native subjects in the Pacific area where former rice fields are not yet back in cultivation. In normal times, Asiatics eat some 350 lb. of rice a head every year.

Argentine Tinned Meat

The export of canned meats to the United Kingdom which had been temporarily suspended by the Argentine Government owing to Great Britain's declaration of the inconvertibility of sterling has now been resumed. The Anglo-Argentine trade agreement of September last year provided that all sterling thenceforth received by Argentina would be freely available for the payment of current transactions anywhere.

U.S. Maize Crop Fails

The United States Department of Agriculture in a recent statement said there was no hope that the U.S. maize crop would recover sufficiently to meet minimum domestic needs and it is assumed that it will materially affect exports. The statement said the real pinch of the maize shortage will not be felt until next spring but high maize prices will offset any seasonal decrease in meat prices during the autumn.

The situation would be even worse if it were not for the fact that there was a carry-over of about 750,000,000 bushels on July 1 and that some 350,000,000 bushels will still be left by October 31.—*Reuter.*

Fear of Food Surpluses

Fear of surpluses was a retarding factor in the campaign for the expansion of food production, Mr. James Turner, chairman of the British Farmers' Union, told the Conference of the Food and Agriculture Organisation of the United Nations at Geneva recently.

"Verbal assurances must give place to positive action," he said. "Farmers are anxious to fulfil their sociological functions of producing food and fibre to feed and clothe the people of the world better."

The FAO could take positive action to help farmers throughout the world to produce enough for all by distributing scientific knowledge and production technique, Mr. Turner said.

The responsibility for making the necessary equipment available would, however, rest primarily with the separate Governments.

Mr. Turner said the International Federation of Agricultural Producers, which he represented, was convinced of the necessity of negotiating international multilateral commodity agreements.

The integration of these agreements with world trade policy through the International Trade Organisation would have to be watched closely by the FAO.—*Reuter.*

MINISTRY NEWS

Bread

An Order which came into force on August 31, 1947, consolidates the previous Orders relating to the control and maximum prices of bread. Restrictions on the use of fats and "improvers" and on the descriptions and shapes of loaves have been removed, and delivery charges in connexion with retail sales of bread are prohibited.

Amendment to Flour Order

An Order further amending the Flour Order, 1947, which became effective on August 31, deletes from the Flour Order, 1947, the provision restricting the quantity of imported flour to be used in making bread, which has simultaneously been re-enacted in the Bread (Control and Maximum Prices) Order, 1947. The Order also increases from 3½d. to 4d. per lb. the maximum retail price of self-raising flour, when sold in weights of less than 3 lb.

New Film for Farmers

"Breeding for Milk" is the title of a new film prepared by the Ministry of Agriculture and Fisheries to stress the importance of grading-up dairy herds with special emphasis on the proven sire. A demonstration of the points to look for in dairy cattle will be of interest to young farmers.

Copies of the film will be available in the autumn. Mobile film units of the Central Office of Information are available for film showings, full particulars obtainable from the Regional Film Officer. Or where a 16 mm. sound projector is available and the film *only* is required, early application should be made to the Central Film Library, Imperial Institute, South Kensington, London, S.W.7.

Chocolate Exports

In accordance with the statement made by the Minister of Food on July 14, and following on the recent press announcement on the exports of cocoa, chocolate and sugar confectionery to programmed markets, a further limited quantity of chocolate and sugar confectionery is now being made available for export to any destination, with preference for exports to hard currency markets.

Bulk export licences are being granted to manufacturers according to their past performance in the export trade. These licences are transferable and each manufacturer has undertaken to supply an equitable share of his quota through his regular shipper or broker. Brokers and shippers should, therefore, approach their normal manufacturers who hold export licences.

Sugar Allocations

From September 14, 1947, the rates of allocation of sugar in food manufacture have been increased as follows:

Cakes and flour confectionery to 70 per cent. of datum usage.

Bakers' prepared materials to 90 per cent. of datum usage.

Syrup for the bakery trade to 55 per cent. of datum usage.

British wine producers and compounders to 80 per cent. of datum usage.

Ice cream by 5 per cent.

Cider from 80 per cent. to 90 per cent. of datum usage.

Coffee essence from 130 per cent. to 150 per cent. of datum usage.

Pickles and sauces from 60 per cent. to 80 per cent. of datum usage.

Cake, pudding, and sponge mixtures from 50 per cent. to 80 per cent. of datum usage.

Infant and invalid foods from 100 per cent. to 110 per cent. of datum usage.

Proprietary food drinks from 40/50 per cent. to 60 per cent. of datum usage.

Ready-made puddings from 40/50 per cent. to 60 per cent. of datum usage.

There will also be an increase of approximately 15 per cent. in the current rate of allocation of sugar to biscuit manufacturers. Details will be circulated by the Cake and Biscuits Manufacturers' War-Time Alliance.

Anglo-Hungarian Agreement

An Agreement has been reached between the Ministry of Food and a Hungarian Trade Delegation for the development of Anglo-Hungarian trade in foodstuffs. The Agreement comes into force at once and will run for three years, during which time increasing quantities of bacon, eggs, and lard will be sent to the United Kingdom as well as supplies of sunflower oil, beans and peas, wine, fruit pulp, poultry, and fresh fruit and vegetables.

Fresh Fruit and Vegetables

In order to give effect to his decision, already announced, that growers of fresh fruit and vegetables may, from September 1, sell their produce direct to consumers, the Minister of Food has made the Fresh Fruit and Vegetable (Relaxation of Licensing) Order, 1947. Prices of controlled fruit and vegetables must of course comply with the fixed maximum for retail prices.

Pigs for Home Consumption

Two changes in the conditions under which slaughtering licences can be issued by local Food Offices to persons who keep their own pigs during the year beginning September 1, 1947, have been announced.

From that date a licence can be granted only to a person who has fed and tended his pig on his own premises for at least four months (instead of for three months as hitherto). This applies also to Pig Clubs and institutions who keep their own pigs for slaughter.

As before, the individual pig owner must surrender 52 bacon coupons to obtain his licence unless he undertakes to sell a side of his pig, but henceforward the coupons can be accepted for cancellation only in blocks of 26 weeks. This means that the bacon coupons will be cancelled either in one ration book for a whole year or in each of two ration books for six months. Coupons for any period before the date of slaughter of the pig cannot be accepted for cancellation.

The Soft Drinks Industry

A scheme has been approved for the de-concentration of the soft drinks industry which has been submitted by the Soft Drinks Industry (War-Time) Association Limited.

Under the scheme, the Association will arrange for the orderly restoration of normal trade practices but this cannot be completed before the early part of next year. The reappearance of makers' own names and trade marks on the labels will mark the end, not the beginning, of the process.

Cocoa and Spices

The International Emergency Food Council announced that future supply prospects for pepper and other spices now appeared sufficiently adequate to obviate any possibility that the need for allocation recommendations on these commodities would again arise. It is consequently removing spices from the terms of references of the Committee on Cocoa and Spices and renaming the committee the Committee on Cocoa.

At the same time the I.E.F.C. announced that the Committee on Cocoa would meet in October to consider the development of an allocation recommendation for the cocoa year beginning October 1, 1947. The Committee on Cocoa at the same meeting will also consider whether any change from the current recommendation as it applies to cocoa butter and unsweetened chocolate couverture may be made in any allocation recommendation which may be developed for the year October, 1947, to September, 1948.

Coal Consumers' Councils—Members Named

The chairmen and members of the two consumers' councils set up under the Coal Industry Nationalisation Act have now been appointed. The chairman of the Domestic Coal Consumers' Council is Dame Vera Laughton Mathews, D.B.E., former Chief Superintendent of the Women's Royal Naval Service, and the chairman of the Industrial Coal Consumers' Council is Sir Ernest W. Smith, C.B.E., D.Sc., a noted fuel technologist and a former President of the Institute of Fuel.

Under the Act the Industrial Consumers' Council may consider any matter affecting the sale or supply of coal, coke, or manufactured fuel for industrial purposes or purposes involving supply in bulk. Such matters may arise either from representations by consumers or on the initiative of the Council. The conclusions of the Council in appropriate cases will be notified to the Minister of Fuel and Power, who may also ask the Council to report upon matters referred to that body by him. The Councils are required to present annual reports to the Minister, and these reports are to be laid before Parliament.

In the selection of members for these bodies, recommendations made to the Minister by bodies representative of the interests concerned have been taken into account. These have included, in the case of the Industrial Council, the Federation of British Industries, the Association of British Chambers of Commerce, the Conjoint Conference of Public Utility Associations, the Chamber of Coal Traders, the Trade Union Congress, the National Union of Manufacturers, the Railway Companies' Association, the Co-operative Wholesale Society, Ltd., the Scottish C.W.S., Ltd., and the British Coal Exporters Federation.

The National Coal Board is represented on both Councils by the deputy chairman, Sir Arthur Street, and the Marketing Director, Mr. J. C. Gridley. Dr. E. S. Grumell, chairman of the Fuel Efficiency Committee of the Ministry of Fuel and Power, is an independent member of the Industrial Council, and Professor D. T. A. Townend, Director of the British Coal Utilisation Research Association, is an independent member of the Domestic Council.

The term of office of all members in the first instance is three years. It is intended at a later date to appoint a deputy chairman in each Council. The secretary of both Councils is Mr. H. L. de Bourcier, M.B.E., Ministry of Fuel and Power.

Information and Advice

Grease for Moulding Trays

B.1991. *It would be much appreciated if you could provide us with particulars of the method of use of an oil or similar substance for preventing table jellies sticking in moulding trays.* (Yorks.)

A hard hydrogenated fat or stearin which has been melted to make it easily spreadable would be the type of fat to use for this purpose. Waxed paper may also be used to line the trays to prevent the jelly sticking and make it easy to remove the jelly from the trays for cutting up into squares for table jellies.

Since all fats are controlled by the Ministry of Food, a permit would be necessary, and this can be obtained from the Ministry of Food providing the firm was a user of such fat prior to 1939.

Sugar Plaques

B.1997. *Recipes for the manufacture of sugar plaques and for non-edible plaques for cake decoration.* (Angus.)

Sugar plaques are generally made from a good gum or modelling paste. Such a paste can be made from the following recipe:

2 lb. royal icing. ½ oz. powdered gum tragacanth.
Mix thoroughly together.

14 oz. cocoa butter. 14 oz. glucose.
Melt and mix together and add to royal icing.

1½ lb. icing sugar.
Mix into the above to make a paste.

Colour as required.

Non-edible plaques may be made by soaking 1 oz. powdered gum tragacanth in a pint of water to make a thick jelly, which can be stiffened up to a modelling paste with potato flour and starch, proportions of each.

Information Supplied

B.1889. *Information with regard to the importation of glacé cherries, also the position governing the packaging of same.* (London.)

B.1890. *Manufacturers of a bench labelling machine.* (Lancs.)

B.1896. *Manufacturers of fibreboard containers.* (Beds.)

B.1898. *Suppliers of almond, peach kernel, teaseed, hazelnut, and edible olive oils.* (N. Ireland.)

B.1899. *Manufacturers of stainless steel sieves.* (Palestine.)

B.1900. *Suppliers of metal caps for jars.* (Midlothian.)

B.1901. *Manufacturers of processing machinery for fresh or dried fruit.* (London.)

B.1904. *Literature dealing with the small scale manufacture of sausages, and manufacturers of the necessary equipment.* (Yorks.)

B.1905. *Manufacturers of machinery for drying brewers yeast so as to preserve its fermenting qualities.* (Staffs.)

B.1909. *Address of importers of maté tea.* (Lancs.)

B.1911. *Manufacturers of spray driers.* (New Zealand.)

B.1912. *Keeping qualities of dried egg albumen.* (Scotland.)

B.1913. *Suppliers of blood plasma and blood albumen.* (Bucks.)

B.1914. *Concentration of fruit juices.* (Nigeria.)

B.1915. *Suppliers of catering equipment.* (Worcs.)

B.1916. *Prevention of discoloration of potatoes.* (Co. Durham.)

B.1917. *Manufacturers of labelling machines.* (Derby.)

B.1924. *Sources of formulae for culinary flavouring essences.* (Yorks.)

B.1925. *Automatic packer for self-raising flour, to handle board varying in calliper from ·014 to ·020 inches.* (Australia.)

B.1926. *Suppliers of aromatised orange fruit juice for cloudy beverages.* (Belgium.)

B.1927. *Information concerning piping jelly and imitation angelica.* (Australia.)

B.1928. *Suppliers of an automatic vacuum filling machine.* (Norway.)

B.1929. *Manufacturers of Fiberkeg containers.* (London.)

B.1930. *Suppliers of a can opener for commercial use.* (Northants.)

B.1931. *Information regarding British markets for sulphited granadilla pulp or juice in casks and also tomato pulp and purée in bulk.* (South Africa.)

B.1933. *Manufacture of custard powder.* (Yorks.)

B.1934. *Manufacturers of British quick freeze equipment.* (Australia.)

B.1938. *Patent for manufacture of glutamic acid.* (Australia.)

B.1941. *Makers of aluminium crates.* (London.)

B.1942. *Manufacturers of bottle-washing machines.* (Scotland.)

B.1943. *Details of a machine used in bacon factories for taking out the blade bone from the shoulders.* (Lancs.)

B.1944. *Suppliers of floor heating equipment described in the July issue of* FOOD MANUFACTURE. (Yorks.)

B.1949. *Removing rust stains from jam pots.* (Northern Ireland.)

Information Required

B.2070. *Is anyone interested in assisting in the institution of a flavour panel in the laboratories of a fruit syrup factory?* (Glos.)

Recent Patents

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2., price 1s. weekly (annual subscription £2 10s.).

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

587,289. WEISS, H.: Air-tight lids for containers.
587,361. STANDARD TELEPHONES AND CABLES, LTD., and MADDOCK, A. J.: Apparatus for heating by high-frequency electric currents.
587,602. BELLOW, E. A.: Tin openers.
587,609. STANDARD TELEPHONES AND CABLES, LTD., FELDHUSEN, I. V., and GLOVER, W. F.: Thermostatic control of electrically heated ovens and the like.
587,628. MILLER, F. J.: Cooking vessels.
587,690. SPOONER, W. W.: Treatment of foodstuffs by cooking.
587,702. JENNINGS, H. W. K. (Danbar Packing Co.): Methods of canning meats.
588,298. U.S. VITAMIN CORPORATION: Vitamin compositions.
588,308. BAKER PERKINS, LTD., and PATERSON, J. C.: Rotary biscuit moulding machines.
588,313. THORNTON, A. A. (Aktiebolaget Separator): Method and apparatus for liberating starch from starch slush, fibres, and fruit water by centrifugal separation.
588,343. RAUSING, R.: Packages and methods for making same.
588,354. SCHWARZ, E. H.: Process for the compression of foodstuffs into briquettes without the use of binding agents.
588,363. BANKS, A., CUTTING, C. L., and REAY, G. A.: Drying of fish.

Abstract of Recent Specification

The Treatment of Meat

The invention relates to a method of preserving cooked or smoked meat by subjecting freshly cooked or smoked meat in its hot state to an initial cooling treatment under bactericidal ultra-violet radiation, and during such treatment, and preferably at about 65° to 70° F. (18° to 21° C.) coating the meat with a sterilised melted wax, the meat being thereafter allowed to cool to room temperature.

The melted wax employed in coating the meat comprises any suitable wax or wax-like substance, such as, for example, a suitable melted paraffin wax. The substance should, however, be of such a character that it does not crack or form fissions when it soldifies, as is the case with ordinary paraffin wax.

When smoked or baked meat, especially ham, comes out of the smoke house, it is almost sterile internally and externally. Contamination begins on its surface from that time on. If a continuous sterile atmosphere can be created during the cooling and storage periods, the meat is protected from action by micro-organisms.

The sterilised melted wax which constitutes the surrounding hermetic sheath, can, if desired, be provided with a preservative capable of destroying or inhibiting the growth of bacteria. Any suitable substance may be employed for this purpose and added to the said wax. It has been found that sodium benzoate gives satisfactory results and is particularly desirable in the present case involving a food product.

583,219. *George Raymond Shepherd.*

Trade Marks

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

MAPPO.—644,324. Cooked potatoes and potato preparations. **M.P.P. (Products), Ltd.**, Carrow Works, King Street, Norwich.
ROASTEX.—644,418. Gravy powder. **H. J. Green and Co., Ltd.**, Aldrington Works, Portland Road, Hove 3, Sussex.
COMPRENA.—644,744. Edible oils, edible fats, jellies (for food), jelly powders, jelly crystals, essence of rennet, and preparations for the manufacture of milk beverages. **Cumming, Parsons, Ltd.**, Top Lilley Street Works, St. Mary Street, Queen's Road, Manchester 9.
VINNEY.—644,808. Preparations of acetic acid and caramel for use as food preservatives. **Dear Bros., Ltd.**, 9, Beaumont Road, Plaistow, London, E.13.
COUNTRY LIFE.—645,183. Chocolates, chocolate, and sugar confectionery (not medicated). **A. & Wilkin, Ltd.**, Cremona Park, Benton Road, Newcastle-on-Tyne.

New Companies

Woodwell Products, Limited. (434686.) 3, Market Street, Hoyland, nr. Barnsley. To carry on bus. of cold storage proprietors, refrigerator manufacturers, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: G. G. Silverwood, Brentwood, Market Street, Hoyland; J. R. Woodings, The Roost, King Street, Hoyland; R. J. Dowdeswell, 31, Cobcar Street, Elsecar.

Elfyn Rees, Limited. (434719.) 1, Crane Street, Pontypool. To carry on bus. of chemists, manufacturers of and dealers in foods, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: F. W. Hill, 39, Keynsham Avenue, Newport, Mon.; E. Rees, 33, Keynsham Avenue, Newport, Mon.

Tre-Top Products, Limited. (434780.) Clement Street, Hollinwood, Oldham. To carry on bus. of drysalters, food manufacturers and packers, etc. Nom. cap.: £100 in £1 shares. Dirs.: S. Mellor and Nancy Mellor, 11, Meadow Lane, Oldham.

Hi-Grade Food Products, Limited. (434843.) 8, Nassau House, 122, Shaftesbury Avenue, W.1. To carry on bus. of manufacturers, canners and preservers of food, etc. Nom. cap.: £100 in £1 shares. Dirs.: Dora Isowitzsky and N. Isow, 11, Strathmore Court, St. John's Wood, N.W.8.

Jones Brothers (Prescot), Limited. (434923.) 18, High Street, Prescot, Lancs. To carry on bus. of bacon and butter factors and merchants, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: S. Jones and Emily Jones, 18, High Street, Prescot (both permt.); S. Jones and Alma Jones, addresses not added.

J. Van Smirren, Limited. (434988.) 50, High Street, Boston, Lincs. To acquire the assets, or part thereof, of the bus. of bottling, canning, preserving and processing now carried on at Boston, by Jan Van Smirren, and to carry on bus. of bottlers of fish, meat, fruit, vegetables, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: J. Van Smirren and R. J. Van Smirren, 18, Sleaford Road, Boston, Lincs.

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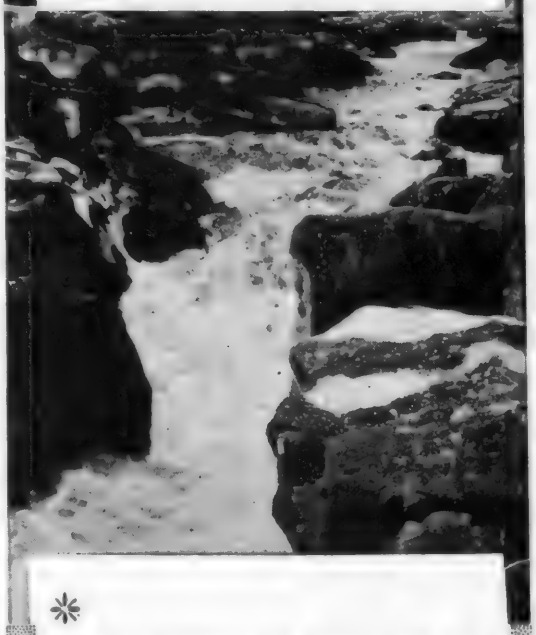

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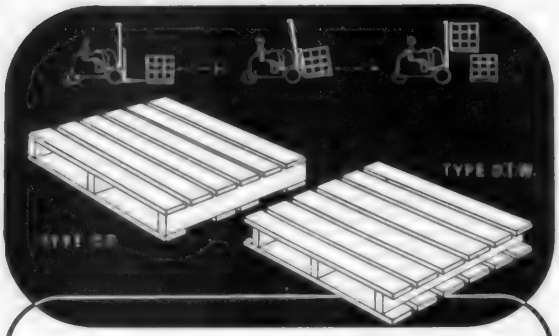

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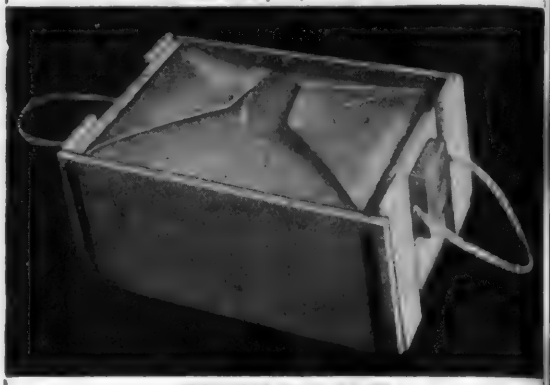

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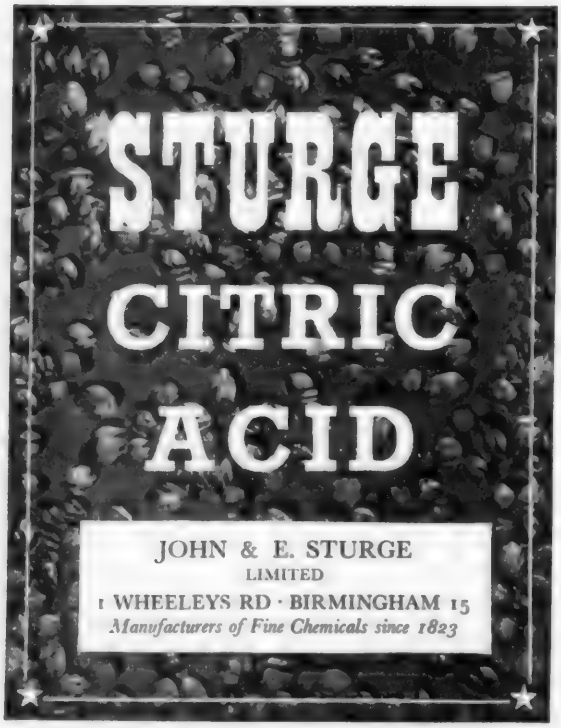

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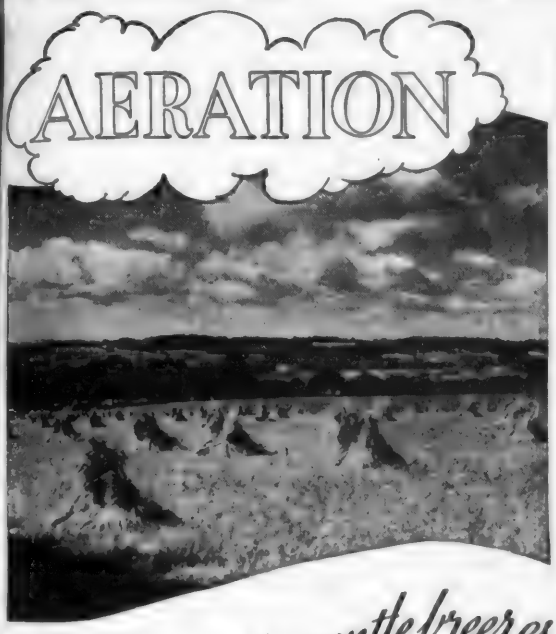

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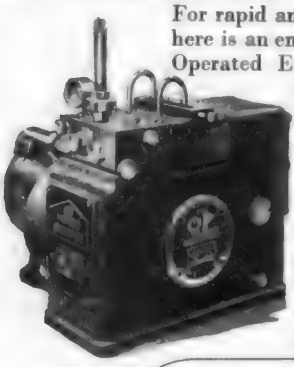

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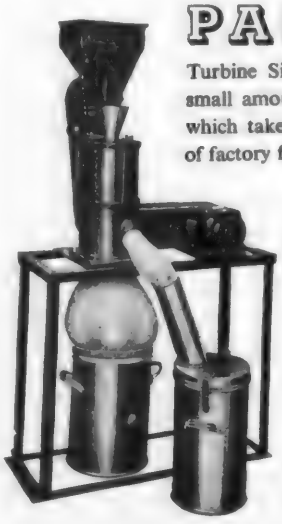

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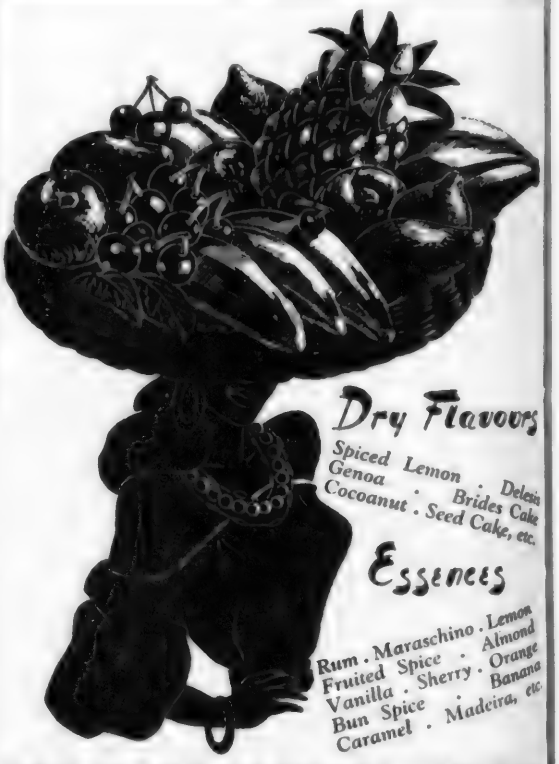

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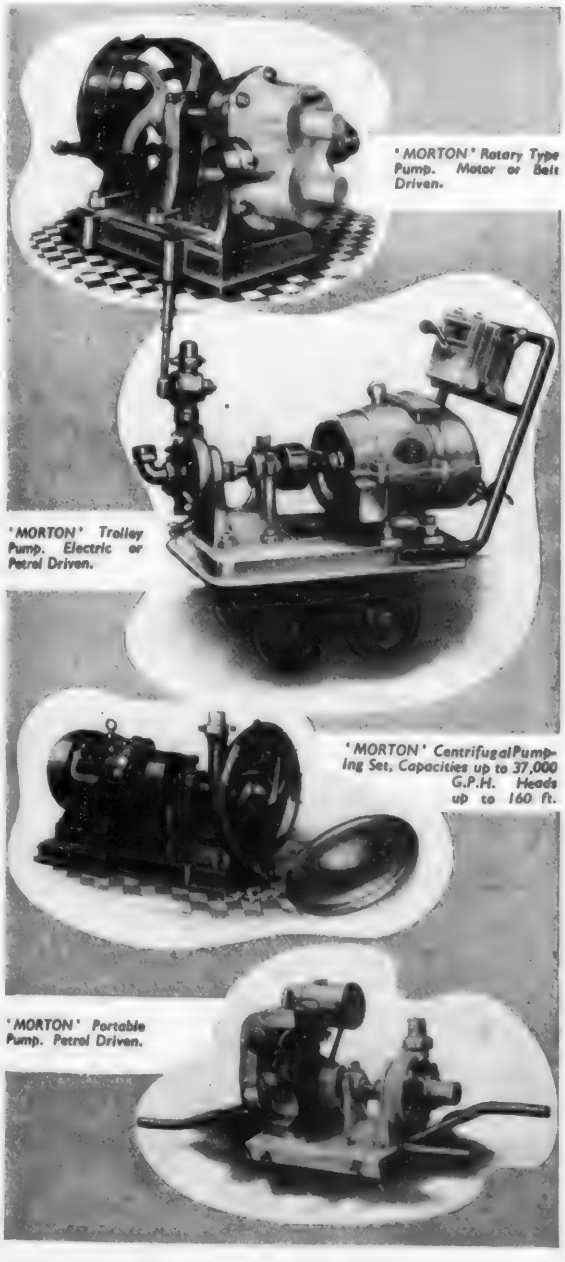

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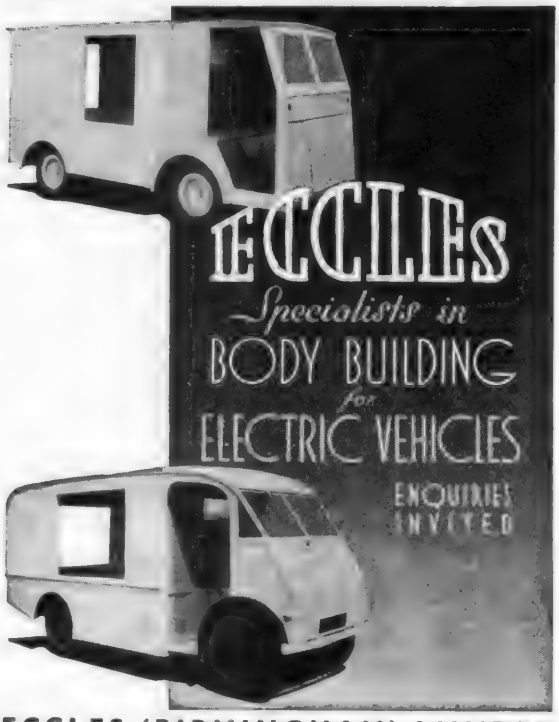

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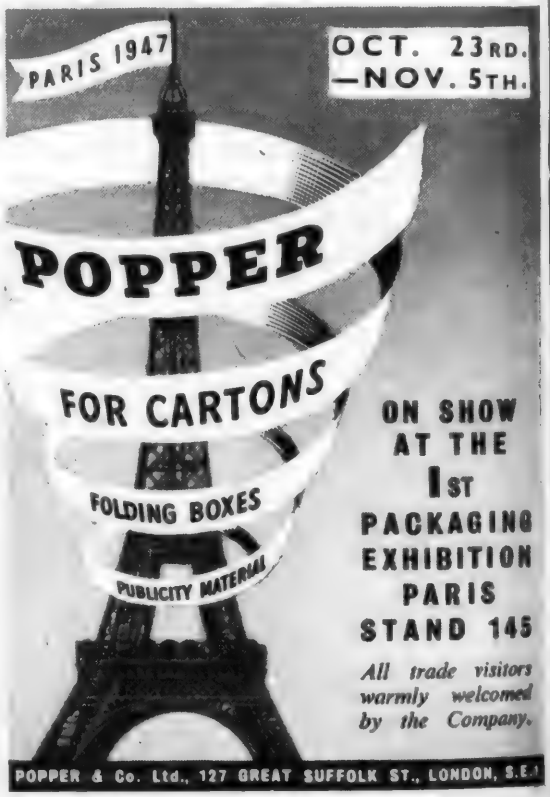
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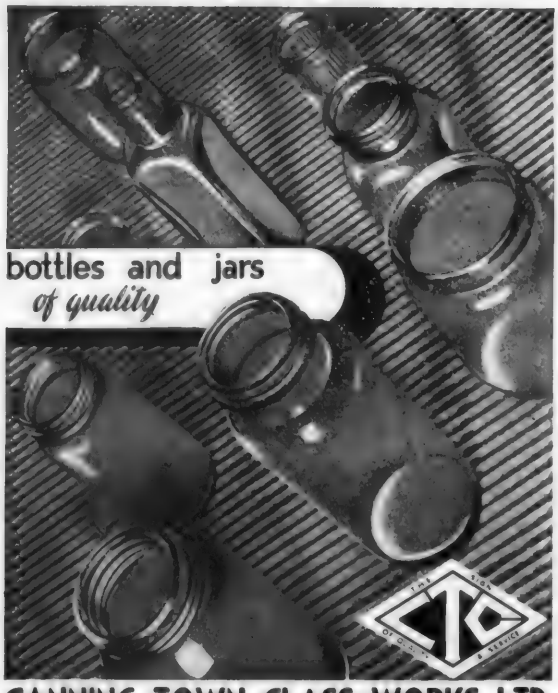

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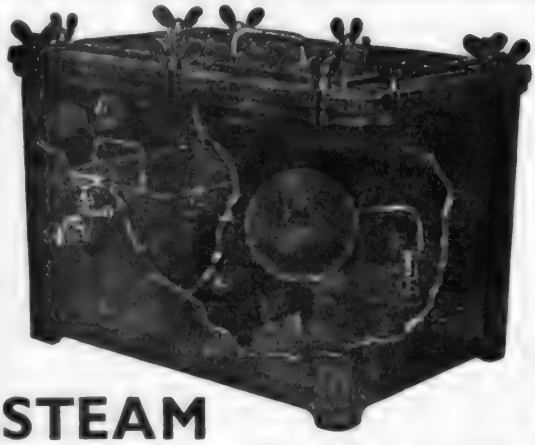

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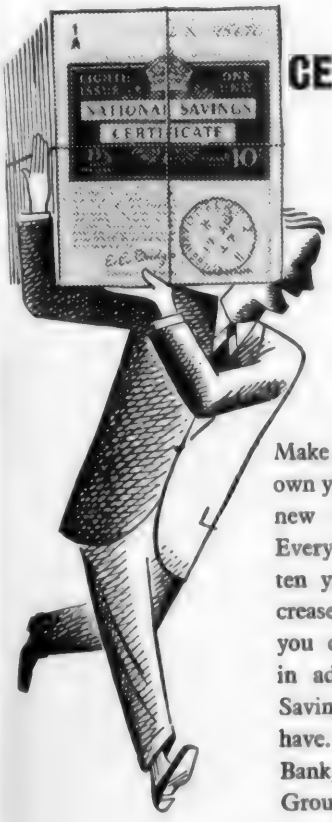

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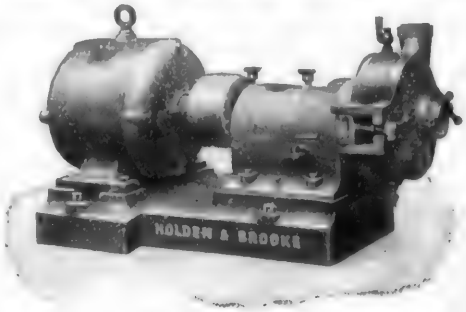

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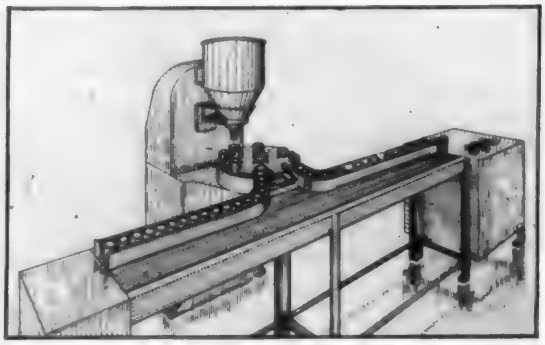

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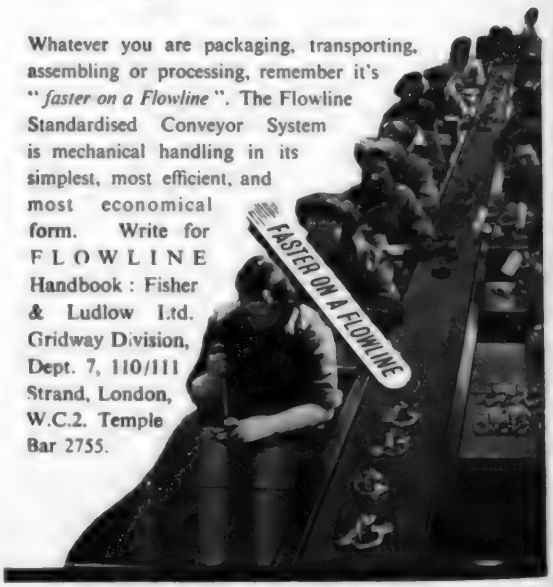

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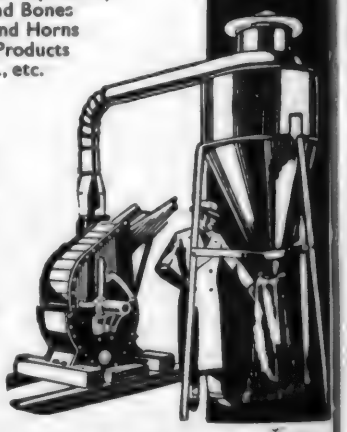

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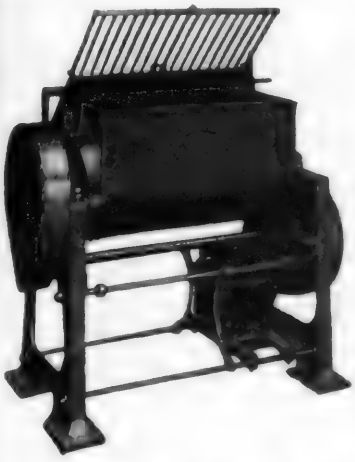

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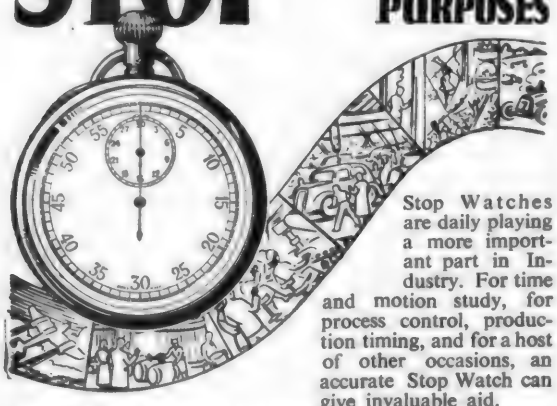

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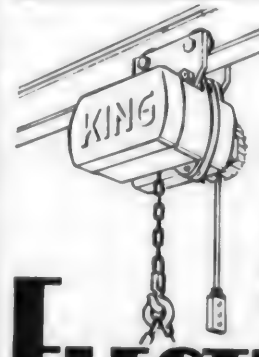

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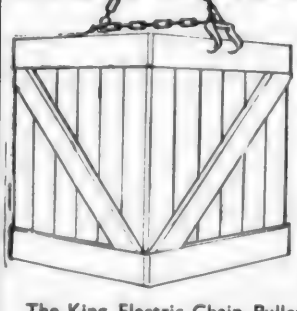

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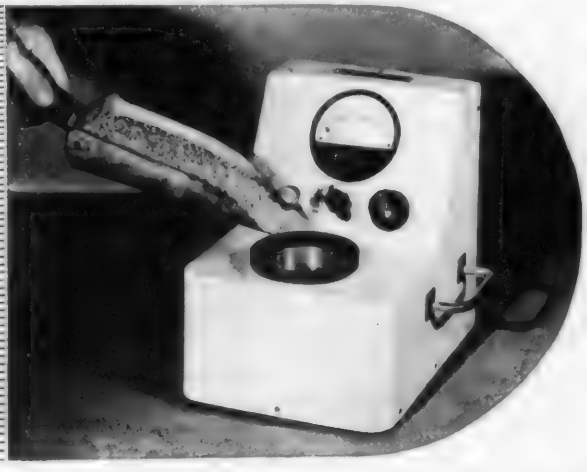

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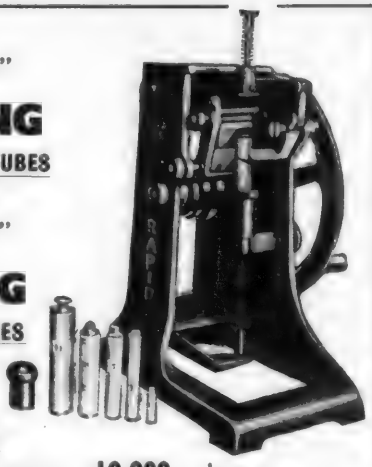

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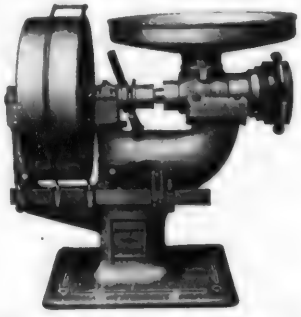

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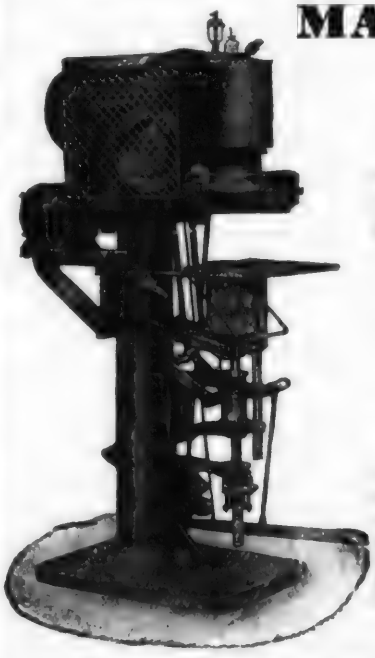

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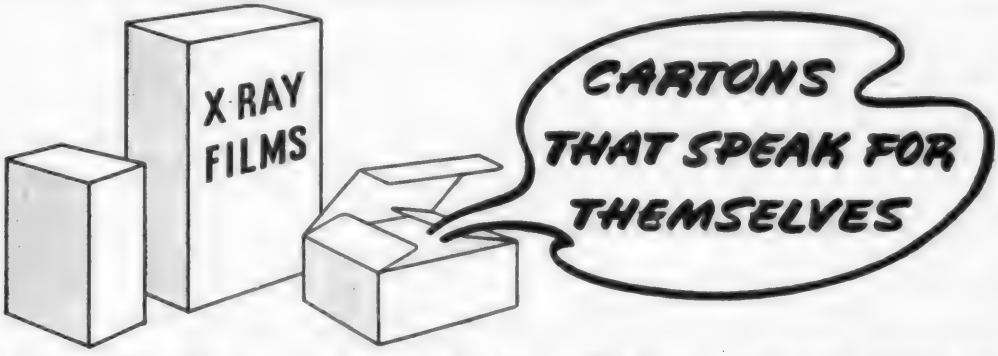

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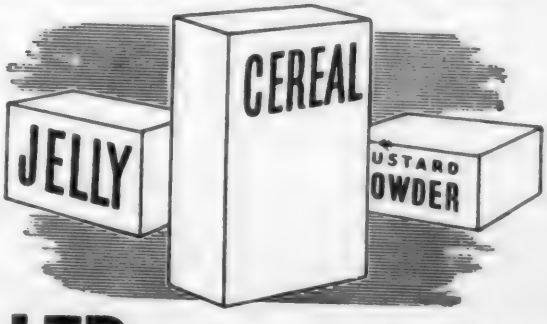

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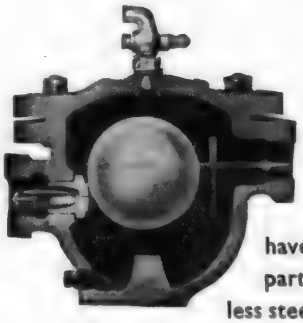

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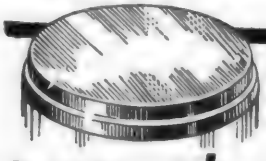

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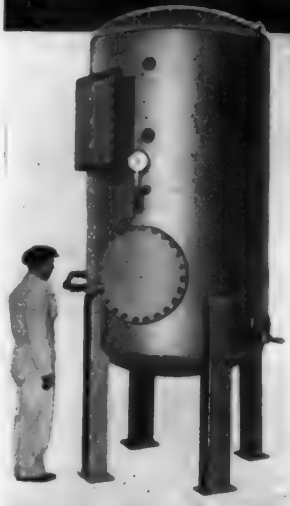

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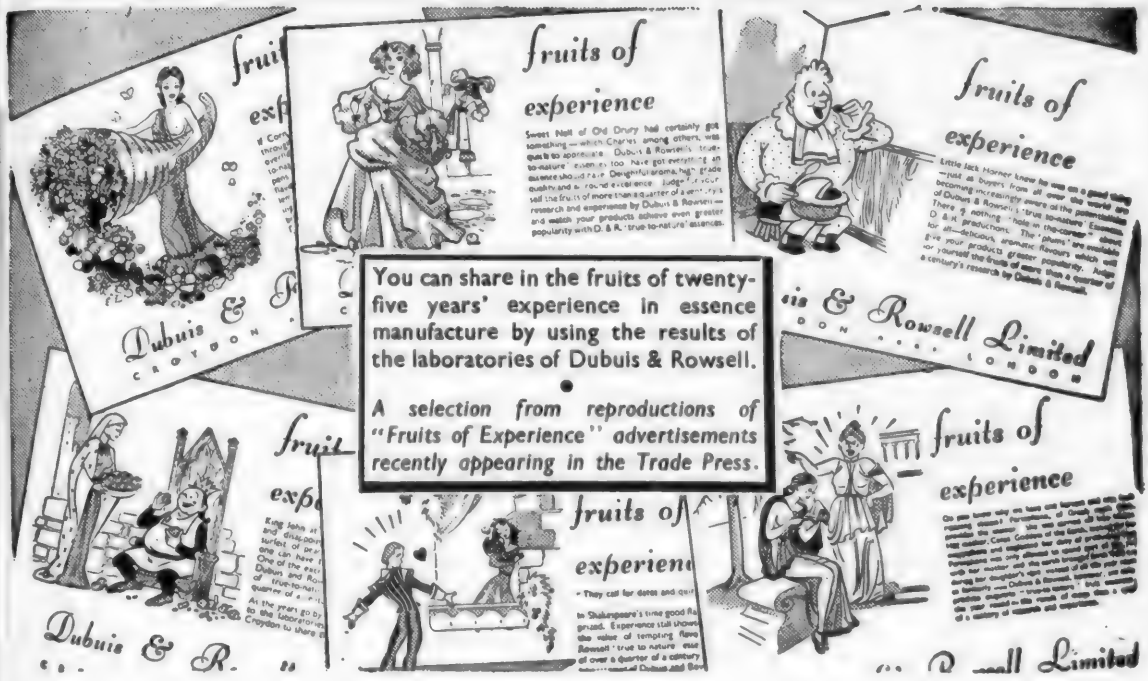
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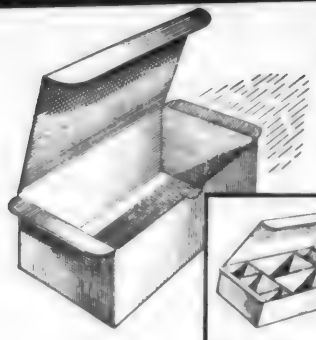

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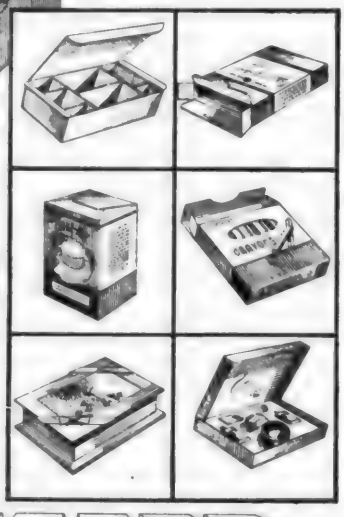

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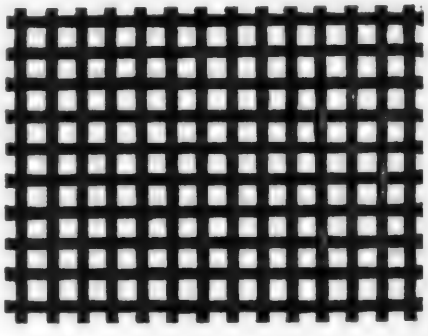

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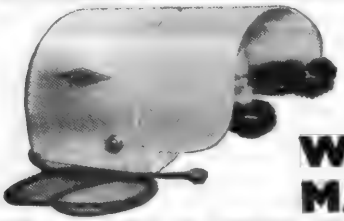

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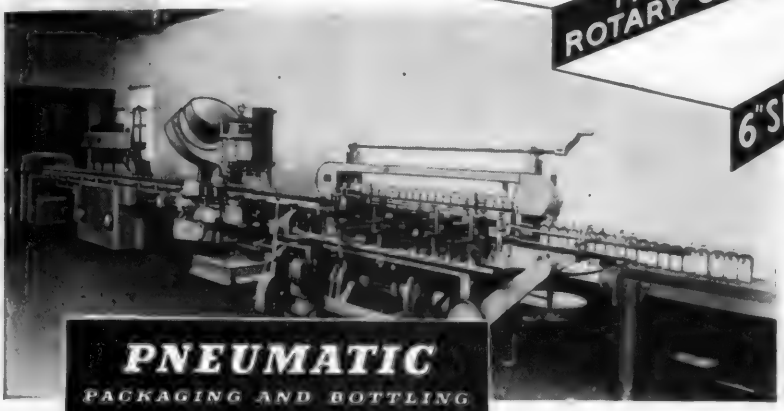

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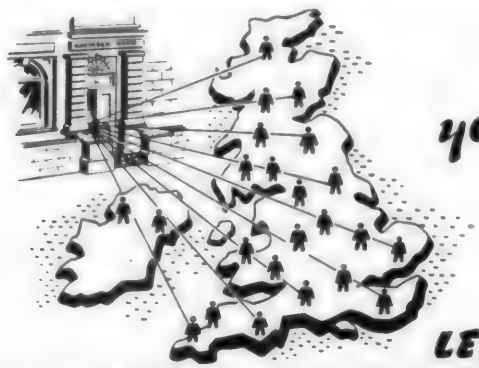

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ASSISTANT Production Manager in a South London Food Factory (producing Custard, Jellies, Cake Mixture, etc.) with branches in the North and in Scotland. Preference given to a young man with an engineering degree and some experience of food production methods. Good opportunity for keen man.—Write stating age, salary, experience and qualifications to Box M2588, Haddon's, Salisbury Square, London, E.C.4.

WANTED for a bacon factory in Kenya Colony. Fully trained young man to take charge of small goods and meat canning department. Knowledge of bacon curing an advantage. Generous terms and leave conditions offered suitable applicant. Factory situated in very healthy country district.—Write Box 1704.

FOOD Manufacturers, established over century, require Manager fully experienced modern processes, capable of controlling Factory, developing and extending range of products presently including Custard Powder, Blancmange Powder, Baking and Golden Raising Powder, Lemonade Powder manufacture, Cereals and Spice pre-packing. Good prospects to applicant who can produce results under Managing Director.—Applications in strict confidence giving full details and salary required to Managing Director, Box B1674.

SPLENDID OPPORTUNITY exists in a modern food factory for a male or female cook with imagination and creative abilities; one possessing domestic science qualifications and practical experience desirable.—Reply in confidence to Box 1727.

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FACTORY Manager, experienced in sauces, pickles, meat and fish pastes. Full details from Box B1733.

CANNERY Manager, 14 years' experience in commercial and experimental canning in four well-known factories canning all products. Sound technical background. Desires change.—Box B1739.

BACON Factory Manager, desires change. Has extensive practical and administrative experience all branches bacon, cooked meat, and provision trade. Managerial and organising ability with efficient staff control and sales supervision. Highly successful record.—Box B1757.

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WELL-KNOWN Food Manufacturers possessing efficient selling organisation covering the whole of England and Wales are interested in the possibility of handling additional high-quality Food Products.—Replies Box 1744.

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WANTED, one or more portable second-hand Smoke Ovens in good condition.—Offers please to Fred Smith, Fish Curer, Albion Street, Grimsby.

WANTED, good second-hand Potato Peelers, Retorts, Pulping Machines, Washing Machines, Filling Machines, Labelling Machines, and Carton Sealing Machine.—Box B1750.

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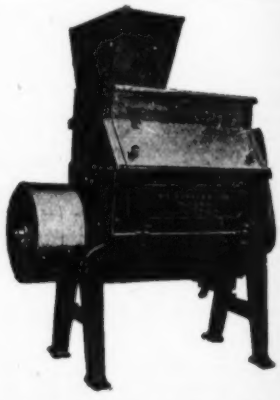

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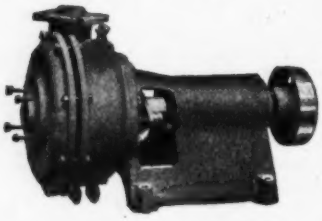

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